









## Downtime

by Chad

### Vital ingredients

THE Kurzweil Reading Machine (we wrote about a new version last week) has an exception dictionary to tell it how to pronounce some of the irregular words in our time-some, unscientific language. The software people had a tricky time deciding which words to include.

You may remember on the Horizon programme last year the machine pronounced "guide" as "gwee-duh". There was one word, however, that was essential they included, and that was "Kurzweil", which by the rules would come out "woel".

Confided one of the programmers to me, "We sure had to make certain it pronounced our president's name right!"

The trouble with this is that there is no limit to the lengths to which you should go. You should, of course, include the name of the prospect you are trying to sell to, and the leader of his favourite political party, and his favourite character in literature. Anticipating this, the designers have thoughtfully not provided a keyboard to update the dictionary.

They update the software regularly, though, by sending out new cassettes, and the Kurzweil man sighed to me that every time they get letters back from users complaining that they have taken away the machine's character, its endearing idiosyncrasies. Oh to be appreciated.

## Jobs for the boys?

I WAS pleased to see the other day that among all their advances in telecommunications the staff of our wonderful Post Office are still keenly concerned about co-operation with other public employees, and making sure that everyone has enough to do.

Telephone directories were being delivered down our road, and as the men went along they had to tear the plastic straps off the bundles of books.

Now you or I, in our innocence, would have kept a litter log in the van to put the straps in. But the PO men know a trick worth two of that. They drop them all in the road.

All the way down I passed a trail of non-biodegradable plastic straps, thoughtfully provided for the street cleaners to pick up. If everyone organised their work so well, we could get out of our unemployment and economic doldrums overnight.

I presume the PO people got the idea from our dustmen, who succeed in dropping half my rubbish on the steps and the pavement while carrying the bins. Co-operation with the legal eagles is of course necessary to make sure they don't get pinched for littering. It all makes the world turn.

## A burning topic

I'M sick and tired of these nasty computer things ruining all my old world, or rather New World, romance. It seems the government of Saskatchewan has decreed that cattle brands must be standardised so that they can be processed easily by computer. Only alphanumeric characters with the odd bar or diamond will in future be allowed.

Wasted are all those misspent hours of my youth thinking up brands that could

not possibly be changed into another by ornery black-hatted rustlers. I don't suppose anybody asked the cows what sort of thing they would like to have burnt into their bumps.

● If it's in the Daily Mail it must be true. Apparently the Universal Life Church of Montrose, California, has been advertising thus: "Do you believe God is everywhere? If so, let our computer pray for you. More than 100,000 prayers each month. Send two-dollar donation for brochure."

## LETTERS TO THE EDITOR

# Facts about fax—PO puts the record straight

IN the Marketview headed Message transmission must be cost-justified (CW, June 28), there were several factual errors in the description of facsimile transmission systems and standards. I would first like to itemise the errors and put the record straight.

In paragraph 7 it is implied that some facsimile equipment operates at 1,200 bits per second and takes 12 minutes per A4 page. To my knowledge no such equipment exists. Machines transmitting slower than one minute per page invariably transmit an analogue signal (by either AM or FM) and do not even use a digital modem.

In paragraph 8 it is suggested that six-minute transmission is achieved by means of 2,400 bits per second modems and that four minutes is achieved by the use of a compress feature. Both these statements are incorrect. The six-minute transmission is achieved by ordinary frequency modulation, and four minutes by deliberately reducing the resolution by a small amount.

Paragraph 10 is incorrect. The three-minute transmission time is achieved by analogue modulation (AMVSB) and does not use digital modems at all. However, some analogue signal processing procedures, the modulation stage. Two minutes is achieved by a small reduction in resolution as with six and four minutes.

The one minute transmission is achieved by use of a 4,800 bits per second modem and digital compression methods—not by using 48,000 bits per second and wideband links.

Finally, it is misleading to refer to the facsimile standards as "interface" standards. The facts concerning facsimile are as follows:

Facsimile transmission can indeed be thought of as a form of remote photocopying. A document is fed in at one terminal and an exact reproduction emerges at the other complete with company headings, signatures and so on. It is also true that facsimile type terminals have been used for decades by newspapers for transmitting photographs etc, and such equipment conforms to internationally agreed photographic standards.

However, although facsimile has also been used for document transmission purposes, it has not been widely used in the past both because of high transmission costs and because of incompatibility between different models. For many years there

was only one internationally agreed facsimile standard for document facsimile purposes.

This standard, which was incorporated into a CCITT recommendation, provided for the transmission of A4 document in six minutes over the public switched telephone network. However, this six-minute standard, which defined the modulation method, resolution standards etc, was of itself not sufficient to ensure compatibility between six-minute (Group 1) machines.

Before a document can be transmitted from one facsimile machine to another, the two machines must initially "handshake" in order to establish correct phasing and synchronisation. Without agreement on the hand-shaking protocols, compatibility was not possible.

In 1977, a second recommendation was agreed which covered facsimile transmission in three minutes over the public switched telephone network. This so-called Group 2 standard was also based on analogue

modulation methods as was the Group 1 standard. At the same time an agreement was reached on the signalling procedures, which meant that for the first time compatibility was a reality.

Since then many Group 2 machines have come on to the market and compatibility between them has proved to be extremely effective.

With the recognition of the great advantages of compatibility, much effort is going into further, faster facsimile standards, and a one-minute standard is near agreement. This one-minute (Group 3) standard is, however, achieved by going over to digital techniques.

The one-minute transmission uses 4,800 bit/second modems and a relatively simple but effective data reduction method and this Group 3 type equipment is also intended for use over the public switched telephone network.

Even before agreement on a Group 3 standard, there is already work in hand to design a Group 4 standard. With the

rapid advance in standardisation of faster and faster facsimile equipments, there is a real possibility of cost-effective facsimile in the immediate future.

These possibilities are further enhanced by other developments in the facsimile field. For example the Post Office is developing a facsimile store-and-forward system which enables the user to enter a document in about 10 seconds, whence it is stored with the recipient's telephone number for subsequent automatic transmission to a standard (Group 2 or Group 3) unattended receiver.

Thus far from being uncompetitive with word processing systems it is more likely that facsimile has a lot to offer. Furthermore it is likely that facsimile and word processing will converge so that the best features of each can be combined.

DR A. H. ROBINSON  
Head of Facsimile System Section,  
Post Office Telecommunications,  
Martlesham Heath,  
Ipswich.

## A scoop for The Times?

WE have all (ie, Times readers have all) been following events as reported in papers, including CW, and now you are reporting that a re-start is possible in September.

For some time I have predicted (amid hoofs of derision) that The Times could return to the streets (or rather the screens) tomorrow, if they become IPs on the Prestel network.

This would indeed be a scoop for both The Times and Prestel, giving a valuable boost to the latter and new technology to the former.

Sometimes I wonder if any of those involved have ever considered this alternative and if so, why are they keeping us in suspense?

B. N. S. EMMER

Brundall  
Norwich

## Second chance for the IDPM

AS chairman of the new Midland Regional Committee of the IDPM, may I applaud your Computerview (CW, August 2), and add a few comments.

It is not often that history gives us a second chance, but it seems to me that this is the case with the IDPM. We are, as you so rightly imply, on the threshold of an opportunity to build the most professional and influential examining body in the field of commercial data processing, as originally envisaged by the instigators of the IDP 15 years ago.

My experience is that too often such noble aspirations are diluted by well-meaning amateurs and so the driving force is dissipated instead of furthering the aims of the institution.

We in the Midlands are determined to make our presence felt to avoid such an occurrence, so may I appeal to those of like sentiment to put their collective shoulders to the wheel. I doubt if we shall get a third chance.

JAMES F. ROSS  
Birmingham.

## Sorry, wrong government!

THE article on the incentives for computer, electronics and other manufacturers to establish plants in the Republic of Ireland was interesting and comprehensive, but one significant gremlin crept in (CW, August 9).

The writer referred to "the government acting quickly" to

give grants to the DeLorean sports car project. The government in question was of course not the government of the Republic of Ireland. The DeLorean plant is in Northern Ireland, and funded by the British government.

In point of fact, the Republic's

Industrial Development Authority was approached by the DeLorean company with a view to possibly locating its factory in the West of Ireland. The IDA declined to fund the project.

BRIGID RODEN  
IDA, Ireland.

## Where to concentrate my (f)ire on word processing views

THE decision to respond to Chris Ellis' remarks as quoted in your report "WP under fire at Infotech conference" (CW, May 31), came easily. Where to concentrate my (f)ire proved impossible! So let's take it point by point.

1. "Word processing... came in for some statistical attack... Mr Ellis has a neat 10 to 1 as 30 to 3 formula. Mathematically very sound. He errs when he facetiously claims a 5 to 1 ratio of secretary/typists to professional/managers. He also errs when computing managerial salaries as double that of secre-

taries' salaries. Many a manager would wish both dreams were reality.

2. "For example in most companies, secretarial staff accounted for less than 10% of costs, and typing for only 25% of that." My ready reckoner makes this out to mean that typing costs in most companies accounted for 2.5% of costs. In any company (not most) where this is true, word processing sales executives would not only be wasting their "selling time" but would be doing their colleagues a disservice by persisting in their efforts.

3. While I may disagree with Mr Ellis' mathematics and his general theme, I do happily find agreement with him when he says that "office system must centre much more on improving systems." Any solicitor, quantity surveyor or author of mainly repetitive specifications or proposals etc, would certainly benefit not only in productivity but in morale terms given access to a word processor. Why not add to this the attraction of "more efficient typing"?

4. Finally, I have yet to encounter a situation where, when

a word processor has been installed and answer a need, the typist/secretary's job has been lost.

WILLIAM H. POWELL  
Word Processing Consultant  
Dublin.

Please write... THE EDITOR welcomes letters... published in Computer Weekly... or on original paper... must be accompanied by... will be returned... not necessarily for publication.

## DONALD KENNETT REPORTS ON PRESTEL DEVELOPMENTS

# Volume production of sets next year

THE number of Prestel test service participants with sets installed is still only just over 900, compared with a total of 1,500 planned for June last year, and many are only now reaching the level of 15 sets a week, which they expected to produce from the word go.

Estimated quantities have been continually revised downwards because the first

forecasts were made with no experience to give guidance, according to one set maker.

The latest designs are still unproven, so makers are cautious about quoting precise schedules or numbers, but they look forward to volume production at some stage during next year.

Semiconductor companies are now still only sending set manufacturers sample quantities of their latest chip sets, incorporating features such as non-interlaced scan lines on the screen. This causes an uncomfortable flicker, although each character is more fully formed and so should in theory be easier to read.

Several set makers report inquiries from the business community in terms of large numbers, but few have turned into firm orders yet.

If all goes well with the latest designs, one industry source suggested that set makers collectively would build up the confidence and the capacity to produce 1,000 a week by the New Year. He thought that 50,000 was the most likely total for the year, but if the market proved buoyant, production could very quickly be doubled from that level.

Another industry source suggested that there were unlikely to be more than 5,000 sets on the market by the end of the year.

"Any manufacturer who quotes precise figures will have egg on his face," he said, "but it is a very interesting market-place, very fluid."

So September 11 is just another landmark in a gradual build-up, on that date, business

## Steady growth predicted

CONSULTANCY Butler Cox estimates that TV set and terminal supply will bring in more money than providing the service or the information, and the size of the market is all-important in determining costs.

In its report on videotext published this month, Butler Cox also reinforces the prediction of evolutionary growth.

"Prestel will not take off like electronic calculators," the report says, "nor will it fade away. Its growth will be steady rather than spectacular."

The report also recommends that the Post Office change its policy and credit some of the telephone call charge to Prestel, if it is to avoid having to raise tariffs.

The three-volume report covers the principles of videotext, standards, business and domestic markets, progress and plans and the response of key industry sectors. It costs £8,000 and is available from Butler Cox and Partners, 26-30 Holborn Viaduct, London EC1A 2BP.

## Partners urged to bury the hatchet

MEMBERS of the UK videotext industry are being urged to adopt a more positive attitude to achievements in Prestel and to stop criticising each other.

This call has come from the Prestel Liaison Group, formed two years ago by representatives of the three industries involved in Prestel—the Post Office, TV set suppliers and information providers—and its terms of reference now include "discussion of commercial strategy and co-ordination of activities." Its most recent action was to persuade the Post Office that its £500,000 advertising campaign planned for the autumn would be about six months premature (CW, August 16).

Set makers have been criticised for failure to produce sets in large numbers. The Post Office for changing specifications and the information providers for filling their databases with rubbish, or else leaving them empty.

The liaison group urges the industry to recognise that an unusual amount of co-operation has been necessary together with an unusual amount of learning for so many organisations at once and that the latest round of changes will not be the last.

Rental companies and retailers are now improving the training of their installation staff, and the Post Office has overcome its software problems.

It is now agreed that development will be evolutionary and not a sudden switch-on of full-scale production and connection of finalised equipment.

## First bulk order

WHAT is believed to be the first bulk order for Prestel terminals to be used on the public service has been announced by Sealink, British Rail's Channel ferry and hovercraft service. A total of 2,400 terminals, subsidised by Sealink, are to be installed in travel agents' offices throughout the UK by the end of next year.

The terminals will be made by ITT and supplied by Granada TV Rentals starting this October and reaching about 1,200 installed by next March. Sealink is to pay half the rental in the first year and one quarter in the second.

Agents will gain access to Sealink's 4,000 page database on schedules, tour packages, special offers and news-flashes, and will also be able to consult other databases such as ABC Travel Guides.

Travel agent Cosmos regards the move as one of the most significant in the travel trade in ten years, and it has been welcomed by the Association of British Travel Agents.



## Horse of San Marco for Royal Academy

WHAT, readers might ask, does a headless horse being lowered in a protective wrapping from the top of the Basilica di San Marco in Venice (left) have to do with Olivetti—apart from the obvious Italian connection? The answer is that Olivetti has brought the horse, along with its head, to London for an exhibition at the Royal Academy called The Horse of San Marco, which is being organised and financed by the company and which runs from September 8 to October 28.

The bronze horse is one of four (above) dating back to Roman times that have overlooked St Mark's Square from the top of the Basilica for the last 800 years. Not surprisingly, Olivetti was only allowed to borrow one after lengthy negotiations with the Italian government.

The exhibition will feature about 100 paintings and sculptures, including five Leonardo studies and works by Rubens and Turner.

# UKS has Centronics 6000 Series Line Printers EX-STOCK

Available immediately from Cable & Wireless UK Services Ltd.

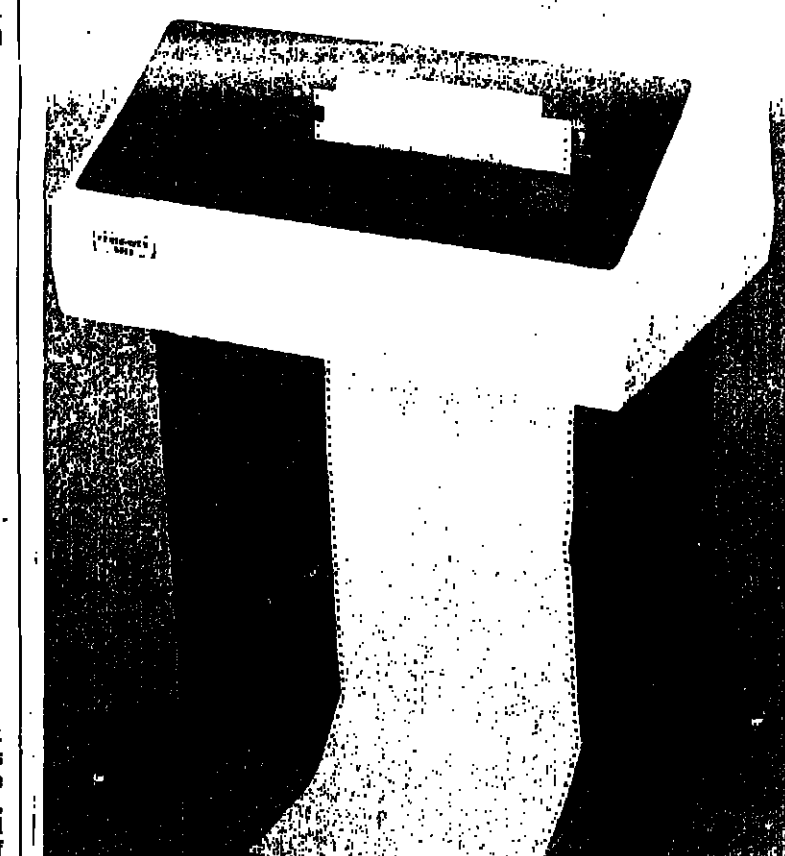
Models 6150, 6300 + 6600, configured to the standard Centronics parallel input specification, with the following options:—

- ☐ Bottom form feed.
- ☐ UK64 ASCII print band.
- ☐ 12 channel direct access VFU.
- ☐ 132 Column printing.
- ☐ Paper jam sensor.
- ☐ Audio alarm.
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### Complete Unit Prices

- Model 6150\* (150 LPM) £3425
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- Model 6600 (600 LPM) £5579

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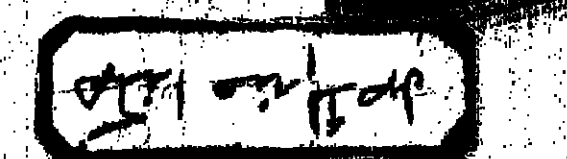
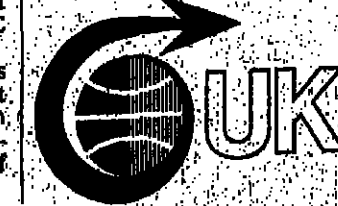


Also available. The following 700 Series Matrix Printers:

- |                 | Basic Price |
|-----------------|-------------|
| ■ Model 779     | £865        |
| ■ Model 700     | £1022       |
| ■ Model 701     | £1241       |
| ■ Model 702     | £1494       |
| ■ Model 703     | £1916       |
| ■ Model 761 RO  | £1371       |
| ■ Model 761 KSR | £1477       |

For further information contact Len Watts at the address below:

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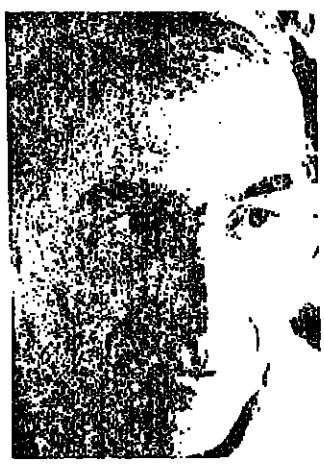
## Special travel arrangements to visit SICOB (Paris)

IPC Electrical Electronic Press Ltd, the world's largest publishers of computer, electrical and electronic journals, have made special arrangements for readers wishing to visit the SICOB exhibition. The cost includes travel by scheduled airline from Heathrow \* first-class hotel accommodation \* arrival and departure transfers \* admission to the exhibition \* services of an experienced tour manager. The programme comprises the following tours:



Tour 1: 19-21 1979 2 nights at the Meeting Hotel, Sharnbrook, 1239-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-186





Dr Christopher Evans

# This revolution will be unstoppable

A universe of possibilities has been opened up to society following the Big Bang of the micro.

Directly or indirectly, its effects will be felt; but whether we will accept the challenge in an intelligent, reasoned way or shuffle uncomprehendingly into the future is some-

thing only future history itself can tell.

In his new book, *The Mighty Micro*, Dr Christopher Evans has done much to modify the Machiavellian aura generally attributed to computers and has closely examined each

layer of the future be it social, economic or political.

In this interview/book review **ROBIN WEBSTER** takes a look at some areas that Evans believes are the most controversial and which will have the most far-reaching impact on every individual.

IF the computers of yesterday were a Goliath, their David of today is the micro. The micro is destined to benefit every individual but, in order to reap the benefits, society will undergo traumatic changes.

Some of these changes will inevitably occur in Man's own concept of himself, and the advent of intellectual activity in machines will have far-reaching resonance. It will be necessary for psychologists to re-examine human intelligence and re-define our concepts of thinking, learning and perception.

In his book *The Mighty Micro*, Dr Christopher Evans, computer scientist and psychologist, has put forward the notion of a three-stage revolution which he says has already begun.

**Stage One (1975-1982)** is the dawn of public awareness in terms of computers, the stage of gimmicks and toys which is already evident.

**Stage Two (1983-1990)** will be when we see the first large-scale changes in the patterns of work and education, economics and social life.

**Stage Three (1991-2000)** will be signalled by political upheavals, and the vastly important emergence of the ultra-intelligent machine.

"As with the Industrial Revolution it (the Computer Revolution) will have an overwhelming and comprehensive impact, affecting every human being on earth in every respect of his or her life," writes Dr Evans.

"Again, paralleling its predecessor, it will run at a gallop, though its time course will be shorter and its force may well be spent, not in 150 years, but in 25."

"Thirdly — again note the parallel — once the Revolution is under way it will be unstoppable... but there is an essential point of difference: whereas the Victorian machine age began, surged into motion and, indeed, almost ran its course before most people were aware of what had happened, we of the

closing years of the 1970s have the gift of foresight, the ability to contemplate — if not for long — the amazing change that man is about to force upon himself."

With this foresight then, we can ask: what will the effect of computers on the human potential be? Will reliance on such machines degrade us in some way or work to our advantage?

When I posed this question to Dr Evans he stated: "It might well be that the human mind will develop far more rapidly in communication with elaborate media devices supplemented by computer power than in any discourse with other human beings."

"Since there is no alternative, anyway, there is little point in discussing the matter. People are going to be more at home with the computer even though many still view them as alien things."

"Unemotional organisms that restrict the randomness of human nature" is indeed how many people would describe computers, but Dr Evans, like others, feels that greater expression rather than restriction will be made possible.

Moreover, he predicts that the introduction of certain devices in the early 1980s will lead, by the end of that decade, to the death of the printed word.

"The fact that we like the feel of paper and the feel of a well-bound book on a shelf will have to change no matter how reasonable such prejudices are," he said.

Filling in the detail in his book he writes: "The read-out terminals of the late 80s will be about the size of the average book today, and of course, you will only need one of them."

"The screens on which the text is displayed will vary in size depending upon what one wants — page-size for the hand-held book, wrist-size for quick reference and portability, a ceiling projection for reading in bed in absolute comfort — at last!"

"So far we have been talking about the book as an entertainer or informer and, to this extent, the 'books' of the 1980s and beyond are not really different in principle from today's."

"But in one respect they do differ, and it is here that the electronic book revolution will have its greatest impact."

By this Dr Evans means that, while the printed book is merely a passive device that transfers information from the mind of one individual (the author) to that of another (the reader), the 1980s computer equivalent will do far more.

"It will be a sifter and interpreter as well as a purveyor of information. Dictionaries, to give the most simple example, will offer packages of relevant information on command."

"You type in a word or a phrase describing the problem area and the computer will respond, probably with one or two questions probing the nature of your interest, and finally by generating a balanced summary with appropriate background information."

Encyclopaedias will be smart too, says Dr Evans, and capable

of doing their own research. But there are problems to surmount; for, if a book is required to "know" its contents, it must have some technique of linking concepts.

"Scanning and classification is quite easily performed by human beings, but is simply too much for computers with their present, rather feeble Intelligence," writes Dr Evans.

"Nor is it a trivial problem to equip computers with the kind of programs which would allow

intelligence Quotient scale so the human mind does not average out at an IQ of 100, but 1,000,000.

At the bottom we have the decidedly unintelligent "species", rock, and just above that at an IQ of 10 we might have the amoeba. Fish cover the 50,000 to 100,000 range.

That gives us an indication of how far ahead we are of the lower orders of life.

Even placing the first generation of UIM at Man's average IQ level may not seem terribly

ant solution which, while not entirely free from flaws, is nevertheless the best that has yet been put forward.

"The key to it all, he pointed out, is to ask what the signs and signals are that humans give out, from which we infer that they are thinking?"

"It is clearly what kind of conversation we can have with them, and has nothing to do with what kind of face they have and what kind of clothes they wear..."

Instead: "Put a human — the judge or tester — in a room where there are two computer terminals, one connected to a computer, the other to a person."

"The judge, of course, does not know which terminal is connected to which, but can type into either terminal and receive typed messages back on them."

"Now the judge's job is to decide, by carrying out conversations with the entities on the end of the respective terminals, which is which."

"If the computer is very stupid, it will immediately be revealed and the human will have no difficulty identifying it."

"If it is bright, he may find that he can carry on quite a good conversation with it, though he may ultimately spot that it must be the computer."

"If it is exceptionally bright and has a wide range of knowledge, he may find it impossible to say whether it is the computer he is talking to or the person."

"In this case," Turing argues, "the computer will have passed the test and could for all practical purposes be said to be an intelligent machine."

Turing's test is designed to eliminate preconceptions concerning human versus machine intelligence, as do the following factors devised by Evans. They deal with the components involved.

"Data capture ability: an entity is intelligent to the extent that it can extract information from the universe around it. All other things being equal, the better its data capture (sensory) abilities, the more intelligent it is."

Here Dr Evans believes that Man is far ahead of the computer, particularly with regard to the classic anthropomorphic robot.

Artificial sensors are still nowhere near the efficiency range needed, and it would require impractical amounts of computing capability just to handle the control of body motor mechanisms such as balance and walking.

"Data storage ability: an entity is intelligent to the extent that it can store information once captured, which can be referred to on future occasions to improve its ability to adjust."

In terms of RAM-type storage, if that indeed is what the brain is mostly composed of Dr Evans feels that humans are just ahead of computers — maybe just by two or three years.

"Processing speed: an entity's intelligence is partly a function of the speed with which its brain/computer can process information. This refers to the

switching speed of its basic units which in the case of most animals are neurones, and in computers, are micro-transistors. Without doubt computers are far superior in this domain and are getting more so all the time.

"Software flexibility: an entity is intelligent to the extent that its software is rapidly and easily modifiable. This may be one of the most important factors."

Evans added in the interview that it was the ability of an entity to update its own software that mattered, not how easy it was for anyone else to do it. At present, humans excel at this.

"Software efficiency: the way in which the system's software has been written will affect the entity's capacity to adjust to novel happenings in its environment. The more efficient the software (the quicker it runs, the less prone to errors or breakdowns, the less 'program space' it occupies) the more intelligent the entity."

Efficiency is still better in humans because "evolution knows how to program very well as it has had a long time to do it in," said Dr Evans.

"Software range: the bigger and wider the range of programs with which a system is equipped and with which its central processor can cope, the more intelligent is the creature."

In Dr Evans' words, "this is one of the most striking differences between man and machine, we really whip them here."

Although Dr Evans clearly believes in the coming of the UIM, there are powerful lobbies and whole schools of thought objecting to its possible development.

One theoretical objection to the desirability of UIMs in everyday life is their insensitivity (being unfettered by human emotions) and lack of creativity.

Dr Evans reminds us, however, of the completely novel computer proof of a Euclidean theorem (that the base angles of an isosceles triangle are equal), where the system simply flipped such triangles through 180 degrees and declared them to be congruent.

Dr Evans believes that the only limits to growth are the limits of man himself, and that in the gap where humans seek answers through "Cults of Unreason" there "remains the real chance that the computer will be seen as a deity and if they evolve into UIMs, there will be an element of truth in the belief."

Nevertheless, it is hard to be impressed by this characteristic statement by Evans in his book: "Lastly, the problem of machine intelligence is one of such intrinsic interest not only to mathematicians, computer scientists, engineers, programmers and psychologists, but to all humans, that the goal of creating an ultra-intelligent machine will prove too tempting to be ignored."

"Even if governments of commercial pressures did not build up, human beings — insatiably curious creatures that they are — would work on independently to achieve this visionary goal."

REFERENCES:  
1. *The Mighty Micro*, by Dr Christopher Evans, 250p., 25pp. published by Victor Gollancz, 14 Henrietta Street, London WC2.  
2. *Cults of Unreason*, by Dr Christopher Evans, 250p., 25pp. published by Victor Gollancz, 14 Henrietta Street, London WC2.

## SOFTWARE FILE

# Datamanager gets user-defined syntax

A WHOLE new range of applications will fall naturally within the scope of MSP's data dictionary Datamanager with the release of the next version of the software, 2.1.2, in November.

Crucial to the new possibilities is a facility which MSP calls user-defined syntax. This will allow the dictionary to be configured to model almost any complex system of dependencies whether related to DP or not.

At the moment, Datamanager is specifically oriented to the documentation of DP systems. Its basic entities include for example the concepts of system, program, module, database, file, group and record.

The system provides a simple language allowing the user to set up, and inquire on complex patterns of inter-entity relationship. Typical "joins" possible include "contains", "uses", "refers to", "calls", "inputs", and "outputs".

Given this data structuring capability, it has been clear for some time that the dictionary in effect, constitutes an end-user database management system, suitable for storing, manipulating and retrieving a great variety of information, either online or in batch mode.

## Dynamic printer output allocation under OS/VS1

A PACKAGE permitting dynamic SPOOL allocation in an IBM OS/VS1 environment is the latest product to be released by the European Software Company. Called Phasor, it gives the user facilities similar to the MVS feature Dynaloc.

Supported under VS1 release 6.0 and above, Phasor allows SPOOL datasets to be allocated and released for early printing. SPOOL is the logical device to which printer output is assigned, and is particularly relevant to long-running tasks such as 'TP monitors, which need not be terminated to print status reports or dumps.

In the case of long-running application programs, it allows

In fact, some users have already applied it outside the area of DP systems. One, for example, constructed a database documenting a complex set of manuals and another used it to hold cross-referenced data on about 1,700 oil wells.

However, its application in such fields has been hindered somewhat by its predefined terminology. This might, for instance, have required a user to remember that a "system" was actually an offfield, while a "file" was a well.

This is the main problem which will be eliminated with the introduction of user-defined syntax.

User-defined syntax will consist initially of two facilities: member type synonyms, allowing the user to specify his own names for Datamanager entities; and the facility to restrict the range of valid relationships.

The latter facility is important to maintain the intelligibility and consistency of the database. While it would be possible for a program either to "call" or "contain" a module, it would make no sense for a department to "call" an employee in a personnel database.

exception reports to be released as soon as they are available, they may then be examined while the application is running.

The package can also help to improve spool efficiency, by allowing spool space to be freed earlier.

Normally, allocated spool space is not freed until all SPOOL output has been printed. Where, for example, output is created for two destinations, the total space is reserved until both users have printed.

The dynamic SPOOL datasets set up by Phasor are, by contrast, treated by VS1 as independent jobs, so that space is released as soon as each dataset is printed.

## Analysing operational stats from key-to-disc kit

DETAILS have come to light of a software package designed to analyse and report on the operational statistics generated by CMC key-to-disc equipment.

Called Midap — Management Information on Data Preparation — the package takes as its input the OAMT records generated by CMC equipment, together with fixed information on the data preparation department and its workload.

Among outputs which can be produced are reports on individual operator activity by workstation and on group activity, by data entry format.

The package can also produce ranked operator performance lists, workload forecasts, and "effectiveness" reports — all of which may help to identify the need for corrective action such as more training, closer supervision, or more frequent equipment maintenance.

John Davey, who wrote the package, argues that Midap overcomes the limitations of the equivalent CMC package Oars,

in particular by putting operator keyrate information into proper context.

Midap, whose first full customer, Lloyds Corporation of Chatham, has been using the package successfully for six months, is written in Ansl Cobol for IBM mainframes. An ICL version is under consideration.

John Davey is at 9 Rosemary Gardens, Chessington, Surrey, KT9 1AQ.

## Puzzler

A CUBE shaped box, with lid, has internal dimensions of exactly 1cm x 1cm x 1cm. What is the side measurement of the largest square plate that can be fitted inside the cube with the lid closed down, and where, precisely, must it be placed in relation to the corners?

Assume for the purposes of the problem that the plate is infinitely thin. See page 37 for solution.

By Peter Hewitt

# Local fillip for ICL's S African prospects

A SOUTH African-developed software product, designed to provide source program management facilities on ICL 1800 and 290X machines, is expected to increase significantly the British company's sales in a market traditionally poorly served by software products from independent suppliers, writes Desmond Frank from Johannesburg.

The product, Illb, is a Cobol storage, maintenance, and retrieval system designed to help programmers to develop and maintain source programs. It will be marketed by SPL, South Africa's largest independent supplier of software and is not connected with the UK firm of the same name.

Lewis Fob, marketing director of SPL, says that while there are many packages available for IBM computers, the South African market is currently characterised by the high penetration of ICL units.

"SPL feels that the time is now ripe for the introduction of Illb to satisfy the increasing number of ICL users."

The new product, he noted, was similar to the Librarian and has three main features.

First, its management reporting function allows the DP manager to monitor programmer activity. Source programs are kept in a centralised disc file called the Cobol library. The reporting facilities tell the DP manager which programs have been active in terms of changes in any period, and by whom.

Second, the system allows programmers to change programs quickly and safely, and in some cases can slash handling time by up to 40%.

Finally, Illb is said to offer a foolproof security system since a completed program, once stored, cannot be altered, destroyed, or retrieved without knowledge of a special password.

## Study looks into Genesys, BOS link-up

A JOINT pilot study has been initiated by Applied Research of Cambridge and Genesys, of Loughborough, to determine whether ARC's software support system BOS could be used to extend the Genesys structural design package.

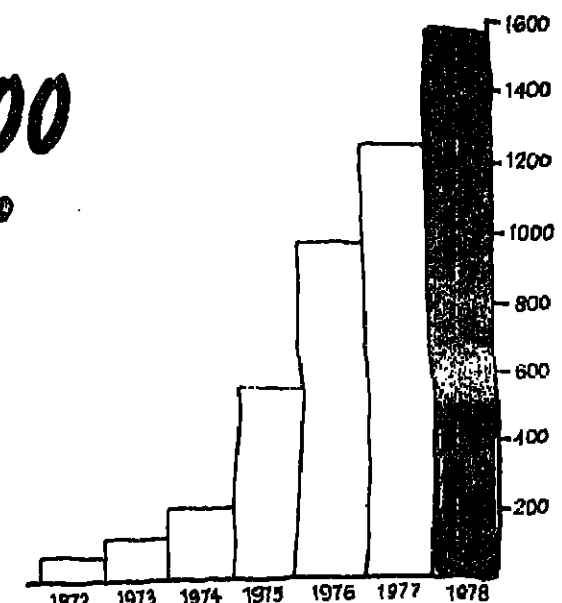
BOS, which underpins many of ARC building design systems, provides facilities for data structuring, interactive access and graphics.

Integrated with the Loughborough software, it would add user-interaction and online graphics to the capabilities of Genesys.

It could also be used to add a Fortran capability to the system, which is currently driven by its own high-level language, Gentran.

**DUE to pressure on space, Programmer Notes has been held out this week.**

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## OP SPOT

By Bernard Allen

# How Tesco achieved a smooth switch-over to 3032 operations

TAKING hardware and many other factors into consideration, Tesco's site at Cheshunt, Herts, is quite an impressive set-up. It's the home of a six-Megabyte IBM 3032 — the first system of that type to be installed in the UK.

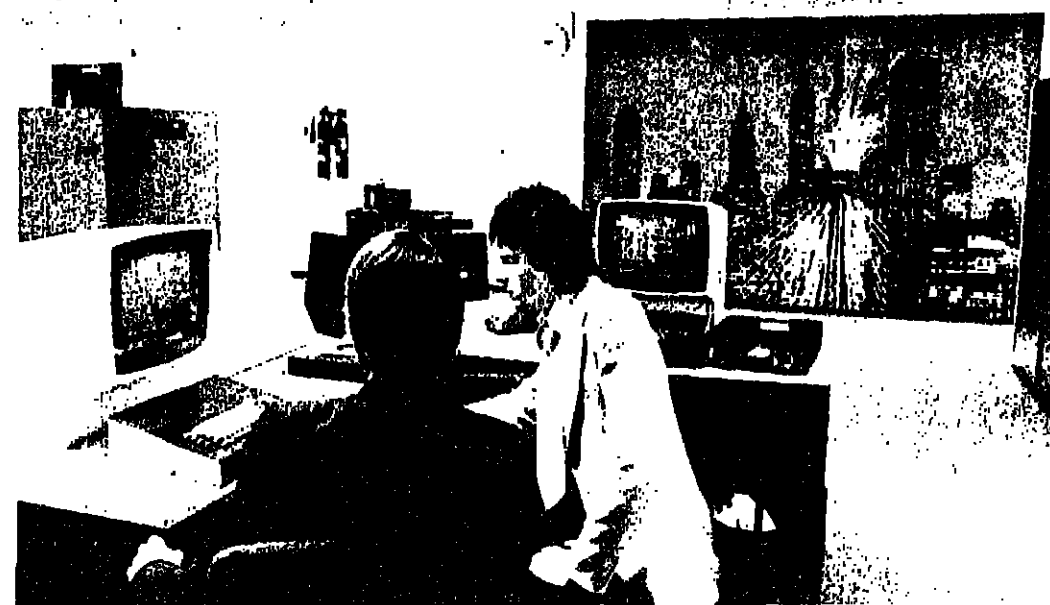
Supporting the machine is a mass storage system which holds an almost ridiculously large amount of data, and two laser printers which produce output about 10 times as fast as the conventional kind.

And when I visited the installation it was in the process of converting its applications to run on the IBM kit, and phasing out three ICL 1904S systems, as operations planning manager Dave Sinclair explained:

"We have just transferred one of our largest systems across, and will soon do likewise with two more. These other two use about 350 EDS 80 disc packs, and that number corresponds with the amount of work they represent to the site."

According to Sinclair, the systems are "very historically based" and therefore ideal for storing on the site's 3850 mass storage system.

"With these particular applications, we keep a lot of infor-



TWO operators looking suitably attentive at the master console. But what's that over there, on the far wall? It's a mural of the New York skyline.

Operations planning manager Dave Sinclair spotted

one similar to it when on a visit to his local paint and wallpaper shop. He took a catalogue into work and showed it to the operations staff, who chose the one shown in the picture. All very democratic.

mation for about three years. The mass storage system is ideal for that purpose. You just put the data on the system and forget about it — that's the beauty of it."

Sinclair continued to speak of the IBM hardware in glowing terms. He was, however, rather less enthusiastic about the operator training courses IBM provides.

"Frankly, they don't seem to do much for the operator who has little or no experience of IBM systems. We used some of their courses, but more often than not they just weren't what we wanted for our operators."

To overcome this, Tesco took some of the operators off shift and gave them an intensive training by means of audio-

visual courses, in-house presentations and practical hands-on machine work.

"We knew that the machine was to be commissioned last July/August. So three months before that, we chose our first IBM shift and put them on days only."

"We used audio-visual courses and ran a number of in-house presentations. I gave one on the 3800 laser printer and Bob York, a shift manager, gave one on the 3850 mass storage system. Then the operators

worked on the machine to consolidate their knowledge."

They repeated the process with a further five operators and "bolstered up the ICL side" by engaging "lots" of contract operators.

In addition to listening patiently to all my questions, Dave Sinclair took me on a guided tour of the installation.

I asked to meet one of the operators and was introduced to Dave Gilpin, a "local lad" who has been at the site for about two years.

Gilpin was one of the first batch of operators to move on to the IBM 3032, and so I asked him to compare that system with the site's ICL 1904S systems.

Weighing the ICL George 2 operating system against IBM's MVS and JES2 spooling system, he said:

"With George 2, a lot depends on how good the operator is. On the ICL systems we used to do a lot of our own scheduling in order to make the most of the resources available."

"Under MVS there is no problem with storage and the like. Each job has all the store it needs, which makes things much easier for the operator."

He also pointed out that with JES2 the operator is able to hold work on the system input and output queues. This is not possible under the George 2 operating system.

"But George 2 does allow you to stop a job in mid-flight and JES2 doesn't," he added.

According to Gilpin, the IBM 3032 gets through more testing work in a single day than the ICL 1904S systems manage in a week.

"The 1904S systems are batch-oriented at our site, which means that there is a considerable administrative overhead."

"The programmers use TSO to submit a lot of their work to the IBM machine. They usually get two or three shots in per day."

"We find that the programmers submit work heavily just before lunchtime and at the end of the day. This means that they have listings waiting for them straight after lunch and first thing in the morning."



Bob York

## Processor in its own right

WHEN Tesco decided to move to IBM kit, shift manager Bob York became involved in a way which was far from the usual smooth installation of the 3032 mass storage system.

"Put crudely, it's an automatic tape library," he said. "The IBM doesn't like to hear it being described in that manner. He's a bit of a doer with a grin."

Nevertheless, that description sums up the role played by the mass storage system. It cuts an operator intervention in disc or file handling — responsibility for the tape or disc mount message getting the volume from the library, and placing it in the appropriate device.

In response to system requests, datasets are "staged" on permanently-mounted 284 disc packs and from there jobs can be accessed by active jobs.

The mass storage system holds 1,000 cartridges, each of which are equal to an IBM 335 disc pack, which stores up to 10 Megabytes of data.

Said York, "The mass storage system holds about 90 per cent of our datasets, excluding the half full at the moment."

According to Bob York, the mass storage system is a mini-processor in its own right and starting it up presents no problems for the operator.

He said, "It is loaded as part of the system start-up procedure. All the operator has to do is start up a trace procedure for the system. York is also responsible for training the operators in the use of the system."

## Printer with all mod cons

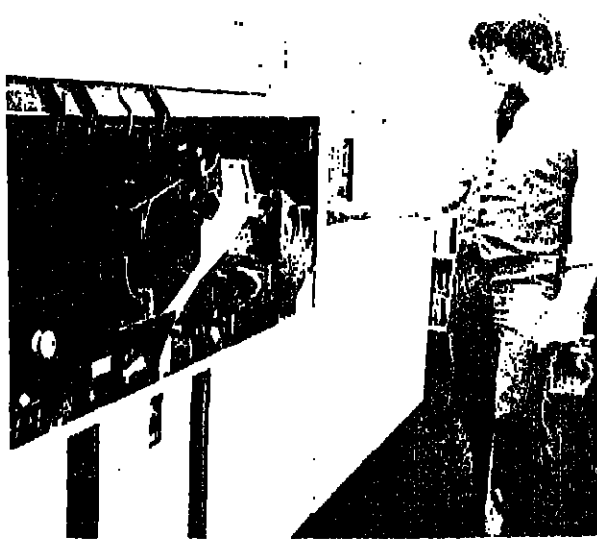
"THIS, sir, is our latest in printers. It's the IBM 3800 laser printer and is your for around £210,000."

"For your money, you get all the mod cons. It's almost entirely self-cleaning, there is no nasty printer ribbon to change and, above all, it produces 14,000 lines per minute."

If by some quirk of circumstance a second-hand car salesman was trying to flog you an IBM 3800, that's the sort of spiel he might well come out with.

Thankfully, Dave Gilpin of Tesco isn't trying to sell the printer — he's just showing how to operate it.

Tesco uses two such devices to produce all its output, aside from that which must be printed on multi-part or pre-printed stationery.



Another view of the Tesco computer room

# Shortage of cobalt could force DP industry to re-design its products

Bohdan Szuprowicz reports from New York

SHORTAGES of cobalt-based magnetic materials used in DP equipment, telecommunications, instruments and other electronic applications are likely to persist in the foreseeable future, according to experts at the recent Internag Magnetism and Magnetic Materials Conference in New York City.

## NEWS IN BRIEF

### Computer aided policing

THE Police Committee of Manchester Council has given preliminary approval for a large-scale plan for computer aided policing.

This will involve a command and control system, computerisation of the Manchester Criminal Records Office, the Police National Computer, and any other systems as they become available.

### Trucking with ICL

TO extend its online system and develop a database covering all its operations, fork-lift truck specialist Lansing is to install two ICL 2960s at its headquarters at Basingstoke, Hants. The machines, costing £1.6 million, with a total capacity of 3 Mbytes, take over from a 1904S, one 2800 running under DMK to ease transition, and the other running under VME/B to develop new systems.

### Agreement

MEMOREX and Olivetti now have an agreement under which Olivetti will build the IBM 3270 compatible Memorex 1377 terminal under licence in Italy for sale there, while Memorex will buy high speed thermal printers from Olivetti for use with 1377s sold all over the world.

### Cutting fleet costs

A TURNKEY system called Vehel and based on the 1500 microcomputer has been launched by ICL. Priced at around £13,000, the system is designed to help cut vehicle fleet costs by monitoring performance and providing information on fuel consumption and maintenance costs.

A cobalt distributor in the US, African Metals Corp, has rationed its customers to 70% of their 1977 orders. Coupled with price increases and uncertainty about the stability of Southern Africa, has forced many cobalt users to consider substitutes.

Introduction of ceramic materials in some magnetic components in computer equipment is directly linked to the cobalt shortages and price increases. Another substitution possibility is samarium-cobalt based magnetic materials that use a smaller percentage of cobalt.

Computer manufacturers, however, face a trade-off dilemma particularly when production volumes of particular products are not very large. Re-design of such products to use other materials may be too expensive to remain competitive and, if the demand for a particular magnetic alloy is not generally large, they may even have a hard time finding a supplier willing to make the alloy. On the other hand they risk further shortages, disruptions, or price escalations if cobalt supplies are again affected by political or military action.

Although cobalt is fairly abundant in nature, high grade deposits are few. Such a large proportion of cobalt production is concentrated in one area of Zaire, that it is becoming a tempting target for those interests who see political or economic advantages in creating cobalt shortages and price escalations.

Although Australia, Finland, Morocco, Canada and Zambia are also cobalt producers in the "free world", their combined production is only 50% as large as that of Zaire.

What is more, in the case of an emergency, jet engines, machine tools, and petroleum refining catalysts are more likely to receive priority for limited cobalt supplies than commercial electronics.

This is further aggravated by the fact that the US strategic stockpile of cobalt is well below its 85 million pounds goal and is also restricted to use by defence industries.

Another factor affecting the supply: it is now believed that West Germany, France and the UK have begun secretly to build up their own cobalt stockpiles.

The Soviet Union, long believed to have been self-sufficient in cobalt, also purchased 300 tons of the metal in 1978 giving rise to speculation that it may become an importer of cobalt in the future.

Cobalt is among the 10 most critical materials rated by the US Army War College strategic materials vulnerability index. Other metals such as chromium, platinum, palladium, tantalum, nickel and aluminium also rate very high on this index.

As a result, the wisdom of developing cobalt substitutes which rely on use of other even more strategic materials is also being questioned.

One of the most promising materials as a substitute appears to be a Japanese alloy based on a mixture of manganese, aluminium and carbon and is rated to be better than ferrite materials also not as good as cobalt-based alloys.

But this alloy, developed by Matsushita, is not yet available outside Japan and it also uses manganese, a metal rated more critical than cobalt by the vulnerability index.

It seems that computer manufacturers and end-users alike might do well under the circumstances to set up their own strategic materials vulnerability index to help them avoid the effects of future disruptions and price escalations over which they have little control.

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The Soviet Union, long believed to have been self-sufficient in cobalt, also purchased 300 tons of the metal in 1978 giving rise to speculation that it may become an importer of cobalt in the future.

Cobalt is among the 10 most critical materials rated by the US Army War College strategic materials vulnerability index. Other metals such as chromium, platinum, palladium, tantalum, nickel and aluminium also rate very high on this index.

As a result, the wisdom of developing cobalt substitutes which rely on use of other even more strategic materials is also being questioned.

One of the most promising materials as a substitute appears to be a Japanese alloy based on a mixture of manganese, aluminium and carbon and is rated to be better than ferrite materials also not as good as cobalt-based alloys.

But this alloy, developed by Matsushita, is not yet available outside Japan and it also uses manganese, a metal rated more critical than cobalt by the vulnerability index.

It seems that computer manufacturers and end-users alike might do well under the circumstances to set up their own strategic materials vulnerability index to help them avoid the effects of future disruptions and price escalations over which they have little control.

Computer manufacturers, however, face a trade-off dilemma particularly when production volumes of particular products are not very large. Re-design of such products to use other materials may be too expensive to remain competitive and, if the demand for a particular magnetic alloy is not generally large, they may even have a hard time finding a supplier willing to make the alloy. On the other hand they risk further shortages, disruptions, or price escalations if cobalt supplies are again affected by political or military action.

Although cobalt is fairly abundant in nature, high grade deposits are few. Such a large proportion of cobalt production is concentrated in one area of Zaire, that it is becoming a tempting target for those interests who see political or economic advantages in creating cobalt shortages and price escalations.

Although Australia, Finland, Morocco, Canada and Zambia are also cobalt producers in the "free world", their combined production is only 50% as large as that of Zaire.

What is more, in the case of an emergency, jet engines, machine tools, and petroleum refining catalysts are more likely to receive priority for limited cobalt supplies than commercial electronics.

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## PEOPLE AND EVENTS

By Judith Morris

## Top jobs with new Marconi operation

A NEW operation has been set up by Marconi Avionics in Nailsea, near Bristol, and Chris Frost has been appointed manager at the site. He has been divisional manager for the company since 1968, and before that was chief engineer of the Instrument Systems division. Frost led the team which developed the world's first modular air data computer.

Malcolm Budge has become area sales manager for Hallmark Computers. He will be responsible for the City and the South East London area. Previously he was in sales management with Remen Vickers and Sankey Sheldon.

Warren Palmer has been appointed general manager of Recognition Equipment, where he will be responsible for all operational activities in the UK. Palmer was UK country manager with Memorex, before forming his own consultancy.

Arnold Buhlmann has become general manager of the Americas and the Far East for Ampex International. He is currently manager of the Switzerland and Eastern Europe region at Fribourg. Taking over this position is Gerd Baumhof, currently Ampex International manager in Sweden. The new regional manager for Scandinavia is Willy Bjorklund.

## Systek man dies in Fastnet race

AMONG the casualties in the Fastnet Race was Roger Watts, 33, director of technical services at Systek, the London-based systems house. He left a widow, Hilary, and a five-week-old son, Gerrard.

Watts was crewing on the Fledgling Tertia, which is owned and skippered by his friend and former colleague Neil Mooney, when he was swept away during the gale. The yacht made several passes in an effort to pick him up but the rescue bid was unsuccessful.

Watts and Mooney had worked together at Sandersons, the fabric and wallpaper manufacturers, where Watts had been divisional systems manager. After leaving the company Watts, who was a specialist on communications and CICS, went freelance and was in Holland for about a year working with IBM and 3M on various software projects. He returned to the UK and joined Systek in July.

A trust fund is being set up by his colleagues and already contributions have been received from friends in Holland. Anyone wishing to have details of the fund should contact Michael Le Costa at Systek, HR House, High Road, North Finchley, London, N12 0AZ. Tel: 01-349 2011.

## COMPUTER COURSES

from The Oxford Business School for British Computer Society Associateship Examination and for Management Briefing. This new series of courses combines the convenience of being able to study at home with the benefits of a personal tutor available by telephone plus optional seminars. For detailed leaflet and application form write to The Director, Dept. Z43, Oxford Business School, 88 Banbury Road, Oxford OX2 8BP, or telephone 0865 54231 (24 hrs.).

Gordon Machen, formerly advanced planning manager for ICL's corporate information systems department in London, has joined Auerbach Simplot to head the company's operations in Canada. The company markets training, techniques and implementation kits in the Americas and Israel.

Ash Emery, previously marketing manager of Protea Computers, has been appointed general manager of the company. Before joining Protea, he was with Computer Sciences in South Africa. Former general manager Edwin Scholtz has now retired to develop his own business.

Warren Naklisher and John Clare have joined BIS Applied Systems training division. Naklisher will lecture on public and in company training courses. He had been involved in public sector training before joining BIS. Clare, whose most recent position was with the marketing team at Atkins On-Line, has been appointed as a consultant for sales.

Glen Armstrong has joined the engineering division of the Exchange Telegraph company as assistant general manager of sales. He was formerly with the bureau RRS, where he was responsible for developing an on-line system.

Peter Flower has become computer services manager of NCB Computer Services. He has been development manager at the Relgate Centre since the formation of NCB computer services. He succeeds Martin Ballinger, who has taken the position of company secretary of Western National.

Geoff Sweeting has become marketing manager for retail and distribution with Systime. He formerly worked for Comet Warehouses, where he was recently involved in the design and installation of a Systime system.

Paul Murphy has joined Lexidata as corporate controller, with overall responsibility for financial management of the company. He was formerly a certified public accountant with Price Waterhouse.

Achie Thomas has been appointed director of the financial systems division of Chubb Cash, succeeding Bill Richardson, who has retired. Thomas has held senior positions with Perkins-Emer and Plessey Communications. He will be based at the Chubb Cash headquarters at Hollingbury, Brighton.

Dave Dye has joined Interlect's sales team, from Borer Electronics in Wokingham, where he was also a salesman.

Richard Hewitt has become sales executive for Safe Computing's 2860 computer bureau. He was formerly a sales executive for Univac.



## Managing director

Keith Hocking has been appointed managing director of BIS-Delta. He joined the company in 1972, and assumed responsibility for marketing and the launching of operations in the Netherlands. He was appointed marketing director in 1977. Newly appointed as operations director is Michael Grott.

Mike Jones has joined Computer Instrumentation as a development engineer in the company's electronics engineering section, to work on computer-based systems development. He was formerly a design engineer and programmer with Marconi Avionics.

Peter Andrews is now sales executive for Westrex in Scotland. He was previously sales executive for Kude Services.

Roger Puttick has been appointed territory manager for the new business branch of Computer Machinery Company. He is to sell CMC Reality Royale and associated business control programs. Puttick has become a salesman after five years with CMC as commercial manager.

## DIARY

SEPTEMBER 5-6 IBM CUA management group. De Vere Hotel Coventry. Tel: 01-551 1643.

SEPTEMBER 6 The future of real time languages in process control. BCS Process Control specialist group. Reading University, Reading, 10.00.

SEPTEMBER 10 Database systems and Information retrieval. BCS Information Retrieval group. Computer Laboratory, Cambridge University, Cambridge.

SEPTEMBER 11 Performance management. IDPM West London and Oxford branch. Teddington House, Hatfield Road, Slough, 10.30.

Bar-coding techniques in stock control. IDPM. Hull Crest Hotel, Ferryby High Road, North Ferryby, Hull, 10.15.

The next ten years in computing. ACM. BCS HQ, 13 Mansfield Street, London W1, 18.30.

SEPTEMBER 13 Optimal control of large scale systems. IEE, Savoy Place, London WC2R 0EX.

IBM CUA Scottish group. Waverley Hotel, Perth. Tel: 01-551 1643.

SEPTEMBER 12-14 Shape recognition and artificial intelligence. AFTEC and IRLA. Toulouse, France.

SEPTEMBER 17 An afternoon with James Martin. IBM CUA and Butler, Cox Associates. The Grosvenor House Hotel, Park Lane, London.

SEPTEMBER 17-21 Computer science and law. Course. CREST and SRC. Swansea University, Swansea. Tel: 0782 28678 ext 502.

SEPTEMBER 25 Aspects of a computer controlled digital telephone exchange — the Plessey PDX. IEE, Granville College, Sheffield, 10.00.

SEPTEMBER 28 Introduction to microprocessors. IEE, Leisure Centre, Stevenage, 10.30.

SEPTEMBER 28-29 Computers in cardiology. IEE Computer Society, Geneva, Switzerland. Contact Computers in Cardiology, Centre de Cardiologie, Hôpital Cantonal, 1211 Geneva 4, Switzerland.

## Real time data in Europe

THE first European conference on real time data handling and process control, called Real-time Data 79, is to take place in West Berlin from October 21-25. Organised by Purdue Europe, the European Committee and the European Council, the event is sponsored by many European bodies including the CEE, the ISO and the Ministry for Research and Technology for Germany.

The main theme of the conference is the standardisation of electronic hardware and software as applied to real time data handling and process control. Major topics will include reviews of hardware and software aspects, applications in industry and medicine, and systems architecture.

For further information contact: Real-Time Data 79, Congress Organisation Company, Congress Centre, John-Foster-Dulles-Allee 10, D-1000 Berlin 21.

## CONFERENCES

THE implications of videotex and Teletext will be discussed at the Professional Videotex Exhibition on November 7-8 at the West Centre Hotel, Little Road, London. The exhibition is aimed at those who will be involved in operating and using the systems. It is sponsored by the Association of Videotex and Teletext and has the support of the Association of Videotex Information Providers, the Post Office and the Department of Industry.

TWENTY experts are to meet at Intotech International's Data Design conference to discuss the latest developments in data and software design. The conference will be held by Intotech from September 10-12 at the London Press Centre, as part of the company's State of the Art series. Speakers will include Susan Gerhart of Information Sciences Institute, and Calvin Galles of the University of Toronto.

THE management studies centre of ICL is organising the World Processing Equipment Display and Conference at the Stockport College of Technology, from morning 10th to 12th September. Each morning Keith Whelan, editor of World Processing Report, will present a briefing of all equipment being demonstrated, and afternoon's activities will include case studies from experienced business users.

FOR the benefit of many people involved in the organisation of road transport, or in industry, public service or government, Oyez International Business Communications is to hold a conference in London on September 18-19. The conference will cover the role of the computer in road transport planning and will include tactical planning of radial journeys and depot operation. For details ring Janice Gowan at Oyez International Business Communications, on 01-242 2481.

THE fifth international conference and exhibition on electronic displays is to be held at the Mount Royal Hotel, Marble Arch, London, from September 4-8. Some 45 companies will be represented at the show which hopes to cover all aspects of electronic displays from liquid crystal displays to large screen displays. Chaired by Professor R. Crundall, of the University of Sussex, the conference is organised by Network, which can be contacted for further details on 0208 5328.

MIAMI BEACH is to be the venue for the 80th conference and communication, DDP and networking which will be held in March 1980. Organised by Datacomm, the conference is the eighth in the series and is aimed at all users, principally top management. Details from Datacomm, 180 Speer Street, Framingham, MA 01701.

ENGINEERING software is the theme of an international conference and exhibition which is to take place from September 4-6 at the campus of Southampton University. The conference aims to provide a forum for the presentation and discussion of research in engineering software and to present a state of the art of the field. Further information from Dr. S. J. P. Smith, Southampton University, Tel: 0703 5111.

## MICRO NEWS

## National Semi chases IBM with add-on memory products

WHEN IBM announced the 4300 line, the ripples from the launch spread far beyond the company's most immediately affected. Minimakers felt the wash right through their business and thought themselves obliged to react, down to offering memory products to compete with the \$15,000-a-Megabyte price tag IBM put on the 4300 memory.

"That was crazy," says Bill LeDuc, product marketing manager at National Semiconductor's minicomputer systems division in Santa Clara. "The IBM product, using 64K chips, has a cycle time of 1.2 microseconds and they won't be shipping it in quantity until 1981 — but the minicomputer manufacturers felt they had to match the price right now, even though their product runs at twice the speed, 600 nanoseconds."

The minicomputer systems division was started some four years ago, and specialises in add-on memory for DEC, Data General and Hewlett-Packard

minicomputers. As a result, dramatic price movements and products like the new Digital Equipment LSI-11/23, in which memory is bundled, make it difficult for the independent suppliers.

"DEC is almost giving memory away on that machine," says Bill LeDuc. "The independent suppliers like Plessey, Monolithic Memories and ourselves only compete by offering more features on the product, and prices 15% to 30% below the manufacturer's price. If you are first in the field with a product then you can get away with 15% but if there's a bunch of others already there you may have to give much bigger discounts. Our aim is to provide memories which

extensive, and interested user base. Now, the introduction of the 4300 range of computers by IBM is starting to distort the market. TIM PALMER went to National Semiconductor in Santa Clara to investigate.

make the machine run faster, and all our memories run at least as fast as the processor will handle."

Latest products in the line include the NS11L, not yet formally announced, the NS23P, NS11Q, and NS11E, all aimed at the DEC world, and the NS D/3 for the Data General Nova 3.

Ray Jones has just been appointed director of marketing for the division. Previously he did the software for the NS11E, which includes ECC, single bit error correct, multiple bit error detect circuitry.

"The NS11E, for the PDP-11 line has an error logger on board to pinpoint bad chips. We wrote a software package for the mini which automatically switches in the spare chip we put on the board and switches out the faulty one."

"It also prints out an error message on the console printer or whatever output device is being used. Thus the user is able to keep his system up and running, and indeed the failure can be completely transparent to the user. The service engineer simply replaces the faulty chip the next time he calls."

The feature also reduces the inventory which stockists need to maintain, so that a stock of chips plus one spare board to take care of catastrophic failures is all that is needed.

The NS11E also requires only a single five-volt power supply, making it attractive for use in remote sites and where battery back-up is needed.

"The chip density on the card is close to the limit," says Bill LeDuc. "By using address and

data latches which free the bus within 100 nanoseconds of a write operation and using a 13-bit byte, correcting on a byte rather than a word basis, we achieve the same performance as non-error-corrected memory. Doing a 26-bit word costs us an extra chip, but is worth it. The standard product is 64K words using 16K chips, but it will also take 4K and 8K chips, the latter being 16K devices in which one element has failed."

The NS11Q provides 128K words for PDP-11 models; it does not include ECC circuitry, but features an on-board parity controller where DEC requires a separate card. Not only does this free up a slot but it saves about 350 nanoseconds in access time. National Semiconductor claims that with a 300 nanosecond access and 450 nanosecond cycle time it is the fastest memory in the PDP-11 world. The NS11L will add features such as the single 5-volt supply to the NS11Q.

Although National Semiconductor was last in the field with memory on the half-size board used in the LSI-11 line, it still managed to steal a march on competitors: designing late, it found it was the only independent offering all the features required on the new LSI-11/23 in its NS23P memory.

For the Data General Nova 3, the company offers the NS D/3, 128K words of 22-bit memory with ECC which it says is still the only error-corrected memory available for the Nova 3.

National Semiconductor got into the business following a big contract from Hewlett-Packard

OEM, which wanted a custom memory product for the HP 21MX. Having developed the memory, the company decided to offer it to other Hewlett-Packard customers. It remains the only MOS memory for the 21MX available from an independent.

"Our market divides into four segments," says Bill LeDuc. "There is the classic OEM who typically wants 500 cards a year. Below him is the systems integrator, who wants up to 100. Then there are the multiple unit buyers, large companies."

"Finally there is the end-user. We have been concentrating on the first two, but we are in process of setting up a whole new sales channel for the low end of the market."

"We operate as an autonomous unit; we have no particular plans to go after any other minicomputer base, although if someone came up with a custom contract we might well turn the result into a product if the potential volume looked right."

Honeywell's Level 6 mini has leapt from nowhere to number four in the mini market: is that a potential target?

"We've looked at it, but Honeywell has designed that product pretty well," says LeDuc. "Their mother and daughter board concept (up to four small boards mounted on a large mother board) makes it difficult for independents. No, our job at present is to build market share."

There is such a shortage of 16K parts right now that Siemens, which planned to enter the US market with a plant manufacturing 64K chips has decided to do 16K as well. If you want 16K parts in a hurry you have to pay for short delivery, but we are fortunate in being able to ride on the back of National Semiconductor's memories for IBM 370 and Intel AS/4 and 5 machines."

Scheduled for launch next month, the range is based on Plessey's 64K-bit device. The PBM 80S is a single card memory offering 500K bits. It has a data rate of 100K bytes per second when operated as a program loader or backing store. It will cost £1,350. An expanded version will also be available, offering up to 2 Mbytes of store. This is the PBM 80M, and when interfaced to a Multibus via a PBM 80MC controller card, will provide an average access time of 7 milliseconds. The memory will cost £3,000, the card £500.

## Basic for Nascom

THE first consignment of 8K-byte Basic cassette tapes for use on the Nascom 1 micro-computer kit has now been delivered to Nascom by Starbase, the company recently started by ex-Nascom software director Tony Rundle.

The language is a modification of the Microsoft Basic interpreter originally developed by Rundle for the Nascom 2 variant of the kit. Here it was designed to locate in ROM. The tape version uses the same approach of copying variable data into a workspace area, so it can also be committed to silicon if required. A minimum memory of 16K bytes is required to support the language.

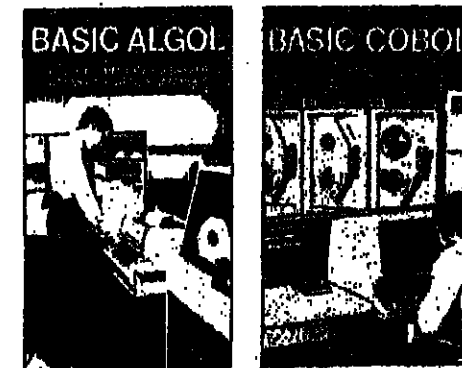
Priced at £30, the tape will be available through the Nascom dealer network.

## Plessey introduces bubble range

NOT to be outdone by Intel's announcement earlier this year of its entry into the bubble memory market, Plessey Microsystems, currently Europe's only bubble memory manufacturer, is introducing a range of systems compatible with the Intel Multibus.

Scheduled for launch next month, the range is based on Plessey's 64K-bit device. The PBM 80S is a single card memory offering 500K bits. It has a data rate of 100K bytes per second when operated as a program loader or backing store. It will cost £1,350.

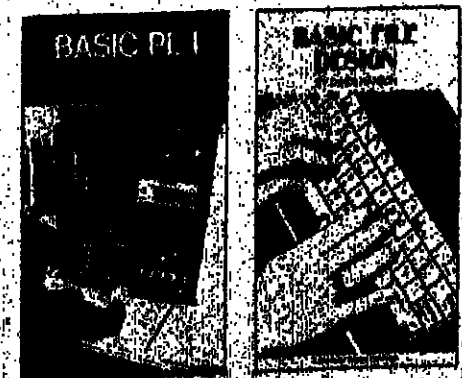
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'Basic Algol', 'Basic Cobol' and 'Basic PL/1' are clear, concise introductions to three of the most commonly used programming languages. Each takes the newcomer to the stage when he can write simple programs himself in the language concerned. 'Basic File Design' is intended for the DP professional, providing him or her with a brief but wide-ranging review of the whole subject. Invaluable to any programmer, systems analyst or DP manager anxious to improve file performance.

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# INTRODUCTION TO PASCAL

## PART 10

By Dr JUDY BISHOP

### Decision to change

THIS series has attempted to describe the elements of Pascal and give some insight into how it is used, that is, how Pascal programmers think. Interesting though it may be, it will have been of no more use than a series of Noddy stories if it has not stimulated you to stop and think seriously for a few minutes. "Should I use Pascal?" A better way of phrasing the question is to break it into two parts: should I change my language and, if so, should I change to Pascal?

#### Should I change languages?

There are few computer linguists these days and few firms that encourage them. With the major languages (Cobol, Fortran or Basic) the situation is even worse in that most programmers are steeped in a particular dialect of their chosen language. For instance, one seldom sees advertisements for Cobol programmers *per se*. It is always IBM 370 Cobol or ICL 1900 Cobol, and many an unsuspecting novice has been confused by the vagaries of Manufacturer X's own special Extended Basic. Thus an individual is likely to be, by force of circumstances, satisfied with his language and unwilling to undergo the trauma of learning the ins and outs of a new one.

This is short-sighted and introspective thinking. It took a lot of courage in 1910 to switch driving habits from a horse-drawn carriage to a model T Ford. Can we afford to stare progress in the face and refuse to acknowledge that it is progress?

Cobol and Fortran were designed when computing was in its infancy (circa 1960) and surely we must believe that improvements worth noting have been made since then. After all, hardly anyone these days would willingly fly across the Atlantic in the once popular Comet.

If these considerations should weigh with an individual, there is even more cause for a large organisation to be aware of and to be open to new trends. There are deficiencies in the 1960 languages. To be frank, they are not even adequate any more. Therefore, why stick with a language merely for loyalty's sake, or because "everyone else uses it"? Because it is too expensive to change, "comes back the answer, loud and clear. Before answering that one, let us look at one more question of principle.

#### Is it worth it?

What do I stand to gain by changing to one of the newer languages (There is no sense in switching to a work-horse that is equally old and decrepit)? First of all, you will be a leader in the field, ahead of the times and able, to some extent to put your stamp on the development of the trend. This kind of advantage is hidden, though what about practical, money-making advantages?

I hope that this series has shown that a new language like Pascal has two great differences over its forebears. It emphasises security — no silly mistakes, no undetected errors — and so, up goes programmer productivity. This has been made startlingly clear in classes at universities where the student programming output has increased in both quantity and quality.

Pascal also places great reliance on a single, machine-independent and international standard language. It is ironic that one of the reasons for sticking to Fortran or Cobol is usually that "it is standard". Any programmer who has used more than one compiler in his life knows this to be a complete fallacy.

But Pascal goes further than just a language standard — there is a common sublanguage among programmers that enables programs to be instantly readable. I have read large system programs written at a variety of installations in Switzerland, Ireland, Minnesota, Poland, Tasmania, all with the barest comments and no documentation whatsoever.

Think of it, no more dialects, in-house rules to avoid them, or maintenance problems when programmers leave. The new programmers will be productive without extensive "immigration" courses.

#### But what will it cost?

Sure, we can dream dreams, but there are real live

considerations to changing a language. The first is usually equipment, but in the case of Pascal, compilers are now available for nearly all machines, and an increasing number of manufacturers support it and compilers are also frequently obtainable at low cost from universities, research establishments or individuals.

The second, and astronomically larger, cost is that of retraining staff. So let's be realistic. No manager is going to walk into work on Monday and say, "Right chaps, we'll all write Pascal from today." There is, however, a way of promoting progress effortlessly. Soon, if not already, all university graduates will be fluent in Pascal.

A company can take advantage of this open situation by letting a keen employee obtain a Pascal compiler and write the odd stand-alone program. Perhaps he or she could give an in-house course. Most of all, the firm could join the Pascal Users Group and keep abreast of what's happening through the quarterly Pascal News.

#### A warning

At this point, I must voice a warning against changing Pascal into something else without changing its name. If you decided to put your favourite feature into Pascal, please call the language something else.

The US Department of Defence has been much in the news over its attempt to find a common language for defence projects. Pascal was chosen only as the base for the language, which is growing rapidly, and now goes under the name of Ada, after the first programmer, Lady Ada Augusta Byron Lovelace, who was a friend of Babbage. There is no harm in this, since the principles of Pascal are applicable under any name. On the other hand, one wonders why they need to change Pascal at all!

#### Why Pascal?

So, if a language is on the cards, why change to Pascal? The answer is that no other post-1970 language can remotely touch its popularity, universality and stability. Take popularity. In one edition of the small computer journal BYTE, there were no fewer than six articles on Pascal ranging from the daring "Pascal versus Cobol" to the eulogistic "In Praise of Pascal". Other magazines have followed suit and Pascal is now being offered in hard-wired form on microcomputers.

In this way, Pascal is a real challenge to the small computer language, Basic. But Pascal is non-sectarian and unchangeable (provided the "change me, change my name" rule is adhered to, and it seems to be). It filled such a wide need when it came out in 1972 that there is unlikely to be another like it. Certainly, in the past seven years the competition has been entirely academic. In short, a change to Pascal will have a permanence about it — for at least as long as run as Cobol or Fortran have enjoyed.

#### In summary

Pascal is not only a language with more than the average number of good features; it also encompasses a way of life. Top-down design, communication through parameters, an abhorrence of abbreviations, are hall marks of the Pascal programmer's trade. It is rarely that one sees a bad Pascal program.

It seems as if Pascal arrived on the scene just as programming came of age, to become the livelihood of thousands and the hobby of twice as many. Programming in Pascal is just that much more enjoyable, productive and secure. Switch now — there is not going to be another language like it for a long, long time!

**NEXT WEEK:** To conclude this introductory series on Pascal, Professor David Barron, head of computer studies at Southampton University, has compiled a bibliography that provides the student with a comprehensive guide to further study of the language.

## Speeding the design of structures

Whether it is a Saab car or a giant North Sea oil rig that you want to design, mathematical simulation can provide a speedy and cost-effective solution, and Computas of Norway believes it leads the world in what it calls super element technique. TIM PALMER reports from Oslo.

THE traditional method of testing structures which have to withstand a wide variety of forces and environmental hazards has been to build a laboratory model and examine how it behaves in simulated conditions.

However, mathematicians have long been aware that a very rigorous approach to testing of multi-element structures could be carried out without ever building the real thing.

The method involves establishing a mathematical definition of each element separately and then assembling the mathematical models into a super model of the complete structure.

At this point, mathematical simulations of various environmental conditions can be applied to the super model and each element separately redefined as necessary for any desired set of parameters.

Until 1969 the technique was little more than a mathematician's toy, since the number of equations which needed to be solved for even fairly simple structures was enormous.

The availability of large computers made it possible to apply the technique to practical problems. The Structural Engineering division of Norwegian consultancy Computas, part of Det Norske Veritas shipping and insurance group, claims to have pioneered the technique and to have taken it further than any of its US competitors.

The advantages of this kind of structural analysis are threefold, according to Computas. It significantly reduces the timescale for designing the structure; it is applicable to almost any kind of structure, however complex; and the cost advantages are increasing all the time as laboratory costs go up and computing costs go down.

The work is actually done on a Univac 1110, shortly to be replaced by an 1100/80, at the Fermata service bureau, which is 40% owned by Det Norske

Veritas. The suite of programs, called Sesam-68, is also available in a version that runs on CDC mainframes.

Computas is investing an annual 200,000 in development of numerical tools and Sesam-68 has been applied to design of North Sea oil structures, nuclear power plants and automobile design.

The concrete structures used in the North Sea cost £1,000 million each, and in one application, where Sesam-68 was used to analyse the mix of materials in such a structure for ideal strength under all the adverse conditions which can occur in the North Sea, 720,000 equations had to be solved.

It was necessary to examine 33 different kinds of loading condition, and solutions took up 350,000 pages which were output on microfilm, and 450 hours of computer time over six months was required on the 1110.

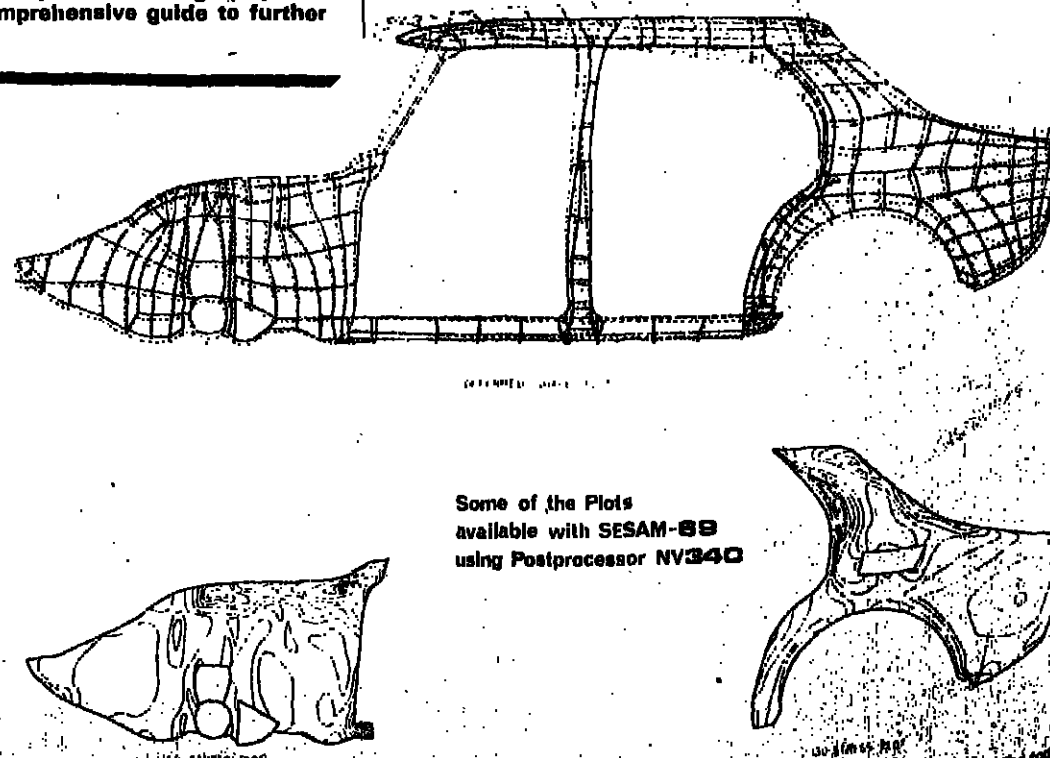
In the automobile field, Sesam-68 has been used by West German car manufacturers, by Saab and Volvo, by UK manufacturers, Renault in France and Fiat, Lancia and Alfa in Italy.

Starting with a mock-up of the car body, the elements are drawn out on a mesh as close as the co-ordinates of each are automatically registered and transferred to magnetic tape.

The 10 most severe loading conditions are then applied in simulation to the assembly and any one part which proves inadequate can be quickly reshaped to meet the requirements.

Once the stresses in each part have been established under all the loading conditions, Sesam-68 can define the minimum amount of material required in each part.

In this way Saab, for example, was able to save 20 kilograms of steel in one model of car, which meant a significant cost saving for the company, and improved performance for the car.



The illustrations show three of the plots taken of the Saab-99 car body during the design process. In the top illustration, the load-bearing elements of the car body are shown at rest, and, dotted, peaks and valleys of the stress patterns. The other two plots show isometric lines which indicate the distribution of stresses in the front side member of the engine compartment, and the rear side panel.

# Intel holds two trump cards in its fight for survival

DESPITE its widely-publicised financial problems, Intel still has two extremely valuable and telling sales arguments to persuade doubting potential customers to take the plunge.

Firstly, the whole point of the IBM plug-compatible business is that the processors are compatible, and all the companies in the field will do everything in their power to ensure they stay that way. Thus no customer has to make a final break with IBM when installing a compatible processor; they can always run for cover back to the womb.

Intel's other trump card is its relationship with Hitachi. The latter is in the computer business for the foreseeable future, whatever happens to Intel.

The possibility has been raised that Hitachi will enter the mainstream computer business under its own flag, but at present this looks very unlikely.

Unlike its nominal Japanese partner Fujitsu, which has 28% of Amdahl, Hitachi has no financial involvement in Intel.

**If the company can soldier on until IBM announces the H-series, when many of the uncertainties now assailing users will be resolved, its relationship with Hitachi could enable Intel to continue to be a thorn in the side of IBM.**

and seems uninterested in entering the US and European markets in its own right.

"The easiest thing for them to do would be to buy us, and they have no interest in doing that," an Intel spokesman commented to Computer Weekly, adding that Hitachi was a very conservative company and was therefore likely to continue its present marketing arrangements for the foreseeable future.

"Hitachi uses Intel for market research, and relies on us to predict what IBM is likely to do in its future systems, which is often contrary to their own design inclinations. We tell them where to put in options which can be activated or extended subsequent to new IBM announcements."

This aspect underlines Hitachi's conservatism, and again shows a marked contrast to Fujitsu. The latter does make full use of its relationship with Amdahl to glean this kind of information, but Fujitsu also has a formidable web of contacts in the US, and some in Europe, to supplement the design and market intelligence gained from Amdahl.

It is not difficult to get information from and about Fujitsu, its products and plans, but it is almost impossible to get similar information about Hitachi.

Having entered the plug-compatible business below Amdahl with machines built by National Semiconductor, Intel in the US is now competing head-to-head with Amdahl across almost all its product line, and has effectively dropped out of the business below the IBM 3031 level. It therefore appears to have decided, like Amdahl, that the market sector to be occupied by the forthcoming IBM H-series, now forecast for the second quarter of 1980, is the

most promising.

Its one remaining National Semiconductor machine, the AS/5-7031, is a strong competitor for the 3031, and falls below the Amdahl 470V/5. The Hitachi-built AS/6-7032 is a single processor competing with the 3032 and the 470V/6, and the dual-processor version, called the AS/7-7033, competes with the 3033 and the 470V/7.

At the top end IBM offers an Attached Processor or Multi-Processor 3033, while Amdahl offers the 470V/8 and Intel the AS/8-7034, based on the Hitachi M-200H and claimed to be the most powerful of the lot.

The M-200H has formidable enhancement capabilities, since Intel's AS/8-7034 is the unimproved version, but the original is designed to be configured with up to four CPUs.

Fujitsu does the same with its own M-200, but Amdahl has resolutely turned its back on AP and MP configurations, maintaining that such complexes are insufficiently reliable and that it is much better to use the fastest technology available and build more powerful uni-processors. The Fujitsu M-190 is almost identical to the Amdahl 470V/6, but the M-200 bears no direct relationship to the V/7 and the enhanced V/8 version.

As was the case with Super Business Machines before Singer put it up for sale, most of Intel's problems appear to be concentrated in the US, and by contrast, several of the European subsidiaries are thriving, so that people are prone to ask "What Intel problems?"

While Intel is out of the mid-range market in the US, at least for the present, it is definitely still in it in Europe, and the remaining National Semiconductor AS/3-5 machines which Intel has to take to complete its existing purchase contract are likely to be shipped to Europe.

It now has two other models, the AS/7020 and AS/7030, for the market (CWL, July 12) — but their introduction will not affect marketing of the AS/3-5.

"This is our biggest selling product in Europe at the moment," Intel told Computer Weekly, adding that of the 50 sold worldwide, 18 had been sold in Europe. The 7020 and 7030 — in fact a single, field-upgradable processor — come from IPL Systems of Waltham, Massachusetts.

They are at present sold in the US by Control Data as the Omega 4801 and 4801II, but Control Data has never been particularly enthusiastic about the business, seeing it as a short-term means of selling more IBM-compatible peripherals. It could well happen, therefore, that Intel will adopt the machines for the US as well.

"We adopted the IPL Systems machines for Europe because they are good products, and we believe that the company has potential in the long run," said the Intel spokesman.

However, IPL cannot at present meet anything like our full requirement for machines of this class. The IPL Systems machines are more attractive long-term than National have come from. National Semiconductor, since they are building the Magna 1800, around a system bus, which

makes field upgrades and modular enhancement comparatively easy. By contrast the National Semiconductor machines are direct reimplementations of IBM 370 architecture using low-cost components.

The AS/7020 competes with the IBM 4341, and the AS/7030 is designed to compete with the unannounced E-series model above it. Full microcode assists for the VM/370 and OS/VSI operating systems are included in the two models, and Intel promises to provide a DOS/VSE assist within one year of IBM making its first European ship-

ment of the product.

Why does Intel not adopt Hitachi machines to compete with the E-series? "Hitachi has an M-140F which would be suitable, but it is only 90% IBM-compatible, and to make it fully compatible would take two years," says Intel.

National Semiconductor is now entering the IBM-compatible end-user market in its own right, starting with the NS 8500, and rated at about the power of the 4341. It is believed to be similar to the machine which Intel has been marketing as the AS/3-5, and is currently being sold in New York, Chi-

A major restructuring is under way at Intel, not only in the mix of businesses in which the company is involved but also in the product line of computers offered. TIM PALMER reviews the current product line-up and suggests that whatever the ultimate fate of Intel itself, Hitachi, National Semiconductor and IPL Systems all have a vital interest in ensuring continuity of service to Intel machines.

cago, Los Angeles, Dallas and Atlanta. European marketing is planned for later this year or early in 1980.

Latest news on Intel's financial affairs is that the company has reported a loss of over \$60 million for the second quarter. Lay-offs are now over 500, including over 200 involved in the design, development and manufacture of computers. The Hawk development project to produce a new small processor has been scrapped, and Intel is seeking a tenant for the land in Rancho Bernardo where it had planned to establish a factory to build the machine.

The joint development project with Hitachi for a new machine to be introduced in 1981 is likely to continue, however.

Following the major deal with Hillman of Pittsburgh to raise money on the residual values of \$100 million of transport and computer assets on lease (CW,

May 31), two contracts for rail cars have been discontinued. Involved were a total of 6,150 goods wagons and 850 flatbed trucks worth a total of \$280 million.

The restructuring of the company still does not seem to be complete, and Intel is now understood to be working out reductions in its operating costs considerably in excess of the \$25 million it originally set as a target.

Despite this, Intel's newly streamlined plug-compatible business does look viable, and if the company can soldier on until IBM announces the H-series, when many of the uncertainties now assailing users will be resolved, its relationship with Hitachi could enable Intel to continue to be a thorn in the side of IBM. Even if Intel folds, Hitachi, National Semiconductor and IPL Systems all have a vital interest in ensuring that full service to customers continues.

## COMPUTER WEEKLY is holding its Annual Ball on Friday, October 12 at the Royal Lancaster

Computer Weekly is holding its fourth annual Ball. Last year nearly 700 people attended what has come to be regarded as the computer industry's big night out.

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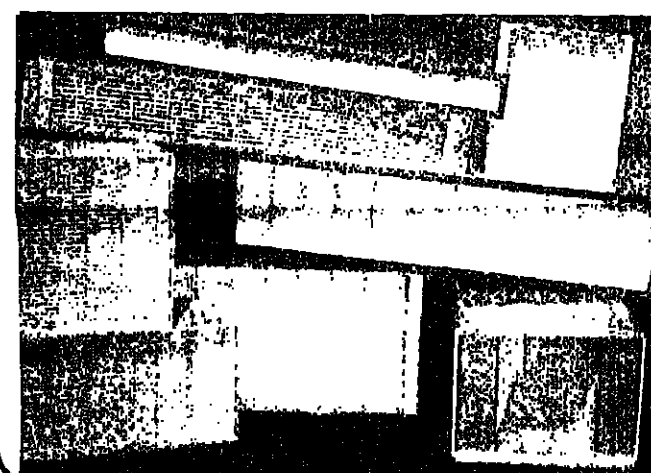
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Computers present special problems of fire protection, and serious hazards also arise from the electrical supply wiring, usually in the floor and ceiling voids. ROB STEWARD, of Bowcom Electronics, explains why it is vital to be able to detect and

attack a fire in a computer suite as soon as it occurs. He regards fire detection and extinguishing systems as fundamental to the protection of computers, and says that all fire detection systems should be approved by the insurers.

# How to prevent fire in the computer room

IN any commercial organisation serious damage to the main computer system, or destruction of the recorded data, can result in an ultimate financial loss many times the initial capital investment in the installation, for computers present a high capital value concentrated in a relatively small space.

Although this is well understood by most computer users, they are sometimes surprised at the intrinsic vulnerability of the computer system to fire risks, and at the insistence of insurers on very comprehensive fire protection arrangements.

Computers also present special problems of fire protection, two of which are of major importance: their high sensitivity to abnormal conditions of temperature and humidity, and the common use of PVC as insulation within the computer suite. At comparatively low temperatures PVC gives off hydrogen chloride, which is not only toxic but corrosive, and a small quantity can cause extensive damage to printed circuit boards and relay contacts.

A similar serious hazard arises from electrical supply wiring, usually located in the floor and ceiling voids. Local heating of PVC insulated cable can soften insulation between conductors, allowing arcing to occur with consequent gross overloading of certain sections of cable. The effect then becomes cumulative, rapidly building up the temperature until the PVC insulation starts to burn, giving off highly toxic and corrosive fumes.

Because of these considerations it is vital to be able to detect and attack a fire in a computer suite as soon as it occurs. Fire detection and extinguishing systems are therefore fundamental to the protection of computers and all fire detection systems should be approved by the insurers for the purpose for which they are installed.

An indicator panel associated with the fire detection systems should be installed in a readily visible position in the computer area. Just as important, however, is the need to reduce the risk of an outbreak of fire to the absolute minimum. This entails the highest standards of "good housekeeping" and of general fire safety practice within the computer suite.

Fires also occur in the electronic hardware of the computer itself, the peripherals and associated equipment. Unlike older forms of electronics in which vulnerable components were chassis mounted, modern electronic systems usually consist of rows of combustible printed circuit boards mounted vertically in frames, and the free passage of air deliberately allowed for cooling can become free passage of flames or incandescent gases if fire develops.

Line printers are the most common type of data output terminal in the computer suite, and the large quantities of paper handled by these machines

obviously exacerbates the fire risk, while punched paper tape, used in many computer systems as the data input medium, must be one of the most easily ignited solid materials in common office use.

The plastic substrate of magnetic recording tape, normally held in very large quantities in the computer suite, is also highly combustible. Reels of this tape stored in metal containers present a comparatively small fire risk and may even survive a fire with recorded data still retrievable, but it is generally more convenient and certainly less expensive to store the tape in transparent plastic containers. These are also considerably lighter than their metal counterparts and, where very large volumes of tape-recorded data are housed on upper floors, plastic containers are sometimes specified in order to avoid overloading floor structures. But plastic containers burn, and although they offer various advantages, they do nothing to reduce the fire risk.

Few premises have satisfactory tape storage. In some the tapes are only separated from the computers by token glass screening; in others the tapes are stored in a separate room, but they may be too small and the tapes may overflow into the computer area.

All tapes except those actually being used should be stored in an adequately-sized room, with enough space to allow for future expansion of operations. The room should be separated from the computer area by fire-resisting construction.

These tapes which are critical to the computer programs should be kept in a fire-resisting storage cabinet complying with the requirements of Appendix II of the CEA Standing Technical Committee's recommendations for the protection of computer installations against fire. As an added precaution, duplicates of these master tapes should be made and stored elsewhere (preferably in another building). This will ensure the minimum disruption of business should there be a fire in the tape store.

It follows from these arguments that adequate fire protection

should be regarded as part of the normal capital investment in the computer installation. Because of the exceptional economic risk associated with the computer suite it is naturally assumed that the precautions taken within the suite will be a great deal more elaborate than those in surrounding office areas, where it may be sufficient to ensure the safety of personnel, with only elementary protection of the material contents. The first essential external fire precaution of the computer suite is, therefore, prevention of fire spreading into the suite from the surrounding area. This implies careful siting in order to provide escape routes for computer staff together with isolation of the suite from the surrounding area by means of fireproof walls, partitions and doors.

Swift and efficient handling of waste materials is fundamental to "good housekeeping". If not cleared away regularly, accumulations of waste form an ideal place for fires to start.

The amount of paper used in computing varies enormously

**Swift and efficient handling of waste materials is fundamental to "good housekeeping". If not cleared away regularly, accumulations of waste form an ideal place for fires to start.**

from firm to firm, and can be as much as one-and-a-half tonnes daily. A certain amount of this will be wasted during the process, and ancillary processes such as cutting, chopping and punching will produce more waste. There may also be spoiled tapes.

All waste material should be kept in metal self-closing bins, which should be emptied at regular intervals — say twice daily. Where throughput is such that there is a large amount of reject paper and other waste materials, a compactor and baling machine can help reduce the fire risk. The important point is to reduce the amount of combustible materials in the computer suite to the minimum.

As well as the principal danger of a fire in the paper store spreading to or affecting the

"By the time the fire becomes detectable to the human senses, it is often too late for simple measures and a serious conflagration has already started."

computer, it must also be remembered that the destruction of the paper store by fire can cause a serious loss of throughput.

A firm which services a large number of customers may have in store several hundred different types of stationery in large enough quantities to deal with several million lines of printed output a week. The problem can be aggravated by the tendency to stockpile several months' supply of paper to overcome delays in deliveries. The quantity of paper in such

cases presents a major hazard. Paper and other materials should be kept to a minimum within the computer suite itself. The store room for larger quantities should have sufficient space for the proposed quantity and should be separated by fire-resisting walls, doors and floors from the computer suite.

All personnel should be fully instructed in the action to be taken in the event of a fire. In a firm using computers there may well be a high rate of staff turnover, but every effort must be made to ensure that staff know the special emergency fire procedure for the computer suite. This should be worked out in advance to cover every foreseeable fire situation and should be clearly displayed in notice form as well as taught to all staff, including cleaners, who

have access to the computer area.

Escape routes and fire notices should be clearly and prominently displayed.

With all possible steps having been taken to ensure fire prevention and the various methods available to deal with it, its occurrence through some electrical fault or other malfunction of the system is always a possibility. The most important factor in combating fires from this type of cause is early warning.

Almost any fire in its incipient stage is quite easy to deal with, confining the damage to the immediate area of the cause. But by the time the fire becomes detectable to the human senses it is often too late for simple measures and a serious conflagration has already started. Automatic early warning detector systems should, therefore, be regarded as essential equipment in the computer suite, the most commonly recommended being those employing ionisation type products-of-combustion detectors. These are the most sensitive detectors available, responding to very small concentrations of smoke particles in the atmosphere.

In this type of early warning system, groups of smoke detectors are connected in simple two-wire circuits to a control unit, which activates audible alarms, automatically initiates computer shut-down and switches off other machinery, including air conditioning. In some cases the controller also activates automatic extinguisher equipment. Each group of detectors covers a particular "zone", and control units are normally available with capacities ranging from one to 20 zones, all multiple-zone units being furnished with panel displays indicating the zones of any detectors going into the alarm condition.

In the main rooms of the computer suite, air which carries smoke particles is likely to be slightly above the ambient temperature, so that the highest concentration of these particles would be close to the ceiling. Detectors covering these rooms, therefore, should be ceiling mounted at intervals recommended by the manufacturer. However, electrical wiring in the floor and ceiling voids is a potential fire source, and detectors mounted in these voids are essential if the early warning system is to be regarded as comprehensive.

Nor should the air conditioning plant be overlooked,

for it can be one of the most effective means of spreading flames or hot gases through a building.

The presence of smoke particles in the air conditioning duct is an obvious danger signal, and their detection can enable trained staff to locate an incipient fire rapidly. Smoke detectors are available mounted in special probe units for fitting to the side of the duct. With these units the air passing in the duct is continuously sampled, and if the smoke particle concentration reaches the danger level this is immediately detected and the alarm triggered.

With its valuable material content, every computer suite should be protected by an automatic extinguisher installation. Even when the building is fully staffed it may not be possible for trained personnel to respond to an alarm in time to prevent a fire developing, especially if poisonous fumes, produced by combustion of plastic materials, prevent entry to the suite. And it must be remembered that, although the fire hazard is reduced when the computer system is not in use, the risk does not disappear altogether. For example, it is possible for a fire to arise from an electrical fault during the night when the computer rooms are unoccupied.

In the opinion of most experts, high pressure carbon dioxide (or similar gas) extinguisher systems are generally recommended for computer protection. This method is preferred to sprinkler systems for a number of reasons. The gas can easily be injected under high pressure into floor and ceiling voids and it causes no damage to the electronic equipment. On the other hand, although it is not toxic when mixed with air, it would obviously cause suffocation when present in sufficient concentration to prevent combustion.

Automatic safeguards are, therefore, essential to ensure that personnel are evacuated before the gas is released. Extinguisher control systems are so designed that alarms are required to activate their circuits, thus preventing response to false alarms; and a fixed delay between electrical activation and the gas discharge allows time for personnel to leave the danger area.

Further safeguards are also provided, such as inhibition of the discharge until doors are closed or an external switch operated.

# Crossword compiling puzzles the programmer

CROSSWORD puzzles, as we know them, are a recent development which, in Britain, have reached a level of great sophistication. The roots of these puzzles lie in the anagrams, acrostics and word-squares which provided much intellectual activity in previous civilisations.

Pythagoras and later Plato and their followers studied and recorded anagrams which became a fashionable Roman pastime. Later classical scholars rediscovered these puzzles and introduced them to medieval Europe. The Jewish Kabbalists, sought mystic significance in the possible rearrangements of the letters of a person's name.

Acrostics are very common in Hebrew poetry and several Psalms — 25, 34 and 119 — are acrostics.

These continued without rivals for some ten years until Robert Simon and Lincoln Schuster published a book of 50 simple crosswords. Three-quarters of a million copies were sold in the first few weeks, establishing the popularity of the crossword puzzle in the States.

Arthur Wynne offered some of his puzzles to C. W. Shepherd of Newspaper Features who purchased six. The first crossword to be published in Britain was devised by Arthur

Wynne and was absolutely and literally correct. It is only in Britain that the cryptic crossword is so extensively developed, a sample clue being "She was his own invention (5,7)".

On the Continent, the definition-type crossword is universal; the brief clues are often printed in the blank-out squares with arrows to indicate the direction of the answer. French and Swiss crosswords are numbered in Arabic numerals across the top and Roman numerals down the side.

American crosswords are usually much larger (25 x 25) and are so designed that all letters are cross-checked by intersecting words.

The largest crossword ever published is one with 7,748 clues and 25,000 squares compiled in eight years by the Belgian Henri Rhaese.

An experienced (human) crossword compiler will take some eight to ten hours to produce a full-sized cryptic crossword. The creative skill of the compiler lies in the composition of the clues, but the setting up of the word pattern within the diagram is a formidable and time-consuming task. Since this is largely a repetitive task of identifying words and phrases of the correct letter-positions, it has been considered suitable for computerisation.

F International was recently asked to evaluate the economic feasibility of crossword creation by computer. Our librarian used IFE's Inspector, and also advertised in Computer Weekly asking for references.

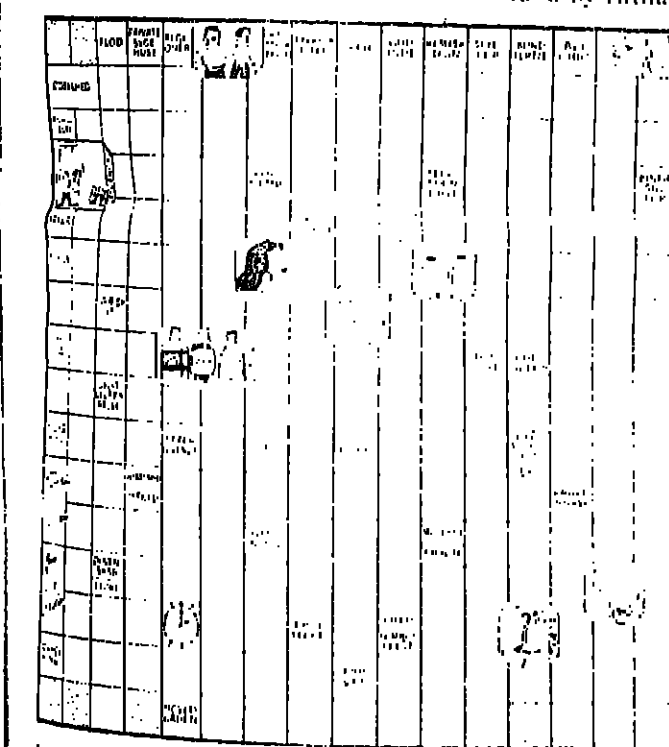
I should like to take this opportunity of publicly thanking Computer Weekly readers who responded — one even with the program ready punched.

Only two programs were identified which could produce crosswords; and in both cases the solutions were trivial.

A paper by D. Feger describes a program which inserts whole words into a puzzle. The user specifies the puzzle pattern comprising the shape and distribution of letter-filled and blank squares together with the first word to be inserted. The first part of the paper discusses the algorithms defining the word positions and their interrelationships. Nine arithmetic values are derived for each square and these control the design process. The second part defines the search and fit algorithms which search the word-list for words of suitable structure. These are then listed and used in turn in the puzzle until completion or a dead-end results.

The program runs on a Telefunken TR4 computer. Using a word-list of some 10,000 3 to 8 letter words, small puzzles (8 x 10 boxes) can be produced in a few minutes. Larger puzzles (30 x 10 boxes) can be produced but the results are not suitable for competition crosswords.

L. J. Mazlick describes techniques to construct a puzzle letter by letter. The decision to



In this Danish crossword, clues in the form of pictures or words are printed in the blank-out squares.

written that the initial letter of each line corresponds to the letters of the Hebrew alphabet. A remarkable word-square

RO T A S  
O P E R A  
T E N E T  
A R E P O  
S A T O R

was found on a piece of wall-plaster at Cirencester. The five words can be read horizontally from left to right in descending rows and from right to left in ascending rows. Also, it can be read vertically downwards from right-hand column across to left-hand column and vertically upwards from right-hand column to left-hand column.

Also unusual, the words also form a sentence which may be translated as: "The swifter Arcturo controls the wheels with an altar."

The piece of plaster can be seen in Cirencester Museum.

The forefathers of crossword puzzles appeared in England during the 19th century; these were of an elementary kind de-

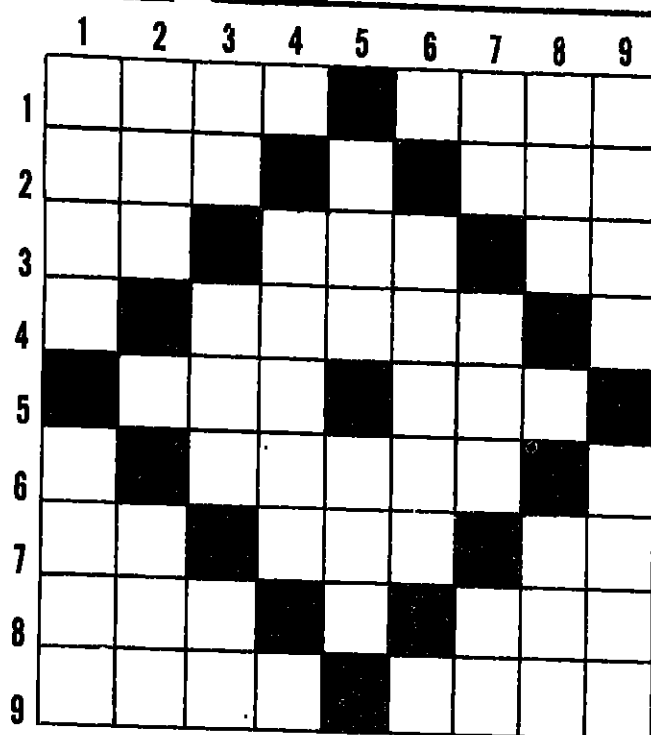
vised from the word-square with clues. The first crossword puzzle was published in the US in 1913. It was devised by a journalist Arthur Wynne who emigrated from Liverpool and on arrival in New York persuaded the Editor of the New York World to publish some simple puzzles in its Sunday Supplement "Fun".

These continued without rivals for some ten years until Robert Simon and Lincoln Schuster published a book of 50 simple crosswords. Three-quarters of a million copies were sold in the first few weeks, establishing the popularity of the crossword puzzle in the States.

Two types of clues are used in crosswords: "definitive", in which the clue is a clear definition of the answer but the answer is not necessarily unique, and the "cryptic" where the clue is ambiguously worded although it will, on examination,

by Judy Cox

SINCE its invention in the 1920s the crossword puzzle has become so popular that attempts have been made to write computer programs to compose the puzzles. Judy Cox, a business analyst with F International, was involved in the company's feasibility study on the subject, and describes the findings here.



In this crossword, most of the letters are cross-checked by intersecting words.

insert a letter is based on the probability of its occurrence at the relevant position in a word contained in a list of possible words. This probability is assessed from statistics associated with a word-list. The priority in which a letter space is

filled is dependent on the number of adjacent spaces and the lengths of the words in which it is contained.

Mazlick's program was run on an IBM 370/135 and puzzles were produced up to a size of 13 x 13 containing words of two in-

four letters from a list of 2,000 such words. Computing times for these solutions were about five minutes.

Neither of these two main studies produced a crossword suitable for publication as a puzzle. In both cases the computing time when attempting this was prohibitive. It is a difficult task to define the algorithms required to sequence and identify the interlocking words and to set up and structure a suitable vocabulary.

Our studies also bordered on the areas of crossword solution and the compilation of clues, but these were not part of the project brief. In addition, our study revealed another reference which was not pursued. This was H. Benbow's Information and Control (Vol 8, p.300, 1963) on "3D crossword puzzles in Hebrew".

F International's advice was, therefore, that there was no commercial justification for using a computer to create crosswords. In part, the economics rested on the incredibly low fees paid to human compilers, most of whom seem to be retired gentlemen exercising their unusual skills more for fun than gain.

Nevertheless, a commission for the computer compilation of crosswords is known to have been placed, though the cost and results of this are not yet known.

## Build a better understanding with the users of microelectronics

## MICROSYSTEMS'80

Wembley Conference Centre, January 30 to February 1, 1980

Microsystems is a conference and exhibition which alerts industrialists and businessmen to the nature of this Second Industrial Revolution, and bridges the gap between the microelectronics expert and the engineers, scientists, systems designers, educationalists and others who use his skill and products. It is an open door to better business for suppliers of both hardware and software — microprocessors, memories, interfaces, peripherals.

In its third year, it moves from a hotel show to the more spacious Wembley Conference Centre, with some 1,400m<sup>2</sup> of exhibition space.

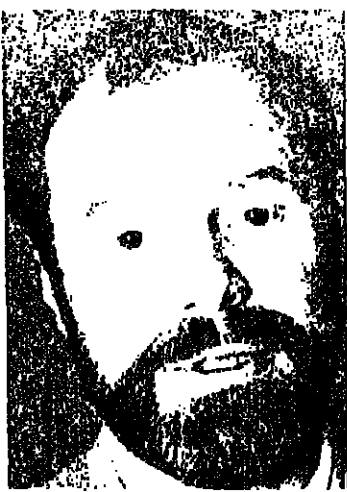
TO TAKE PART IN MICROSYSTEMS '80, CONTACT: LLOYD COLLINS OF "COMPUTER WEEKLY" ON 01-261 8743 OR 0022 OR WRITE TO HIM AT ROOM 13, DORSET HOUSE, STAMFORD STREET, LONDON, SE1 9LQ.

FOR MORE INFO

is a subsidiary of Britain's most influential magazine in electronics and computer technology, published by Computer Weekly, a division of International Data Corporation. "Electron" is published weekly. "Microsystems" is published monthly. "Times" and "Electrical Review" are published on their behalf. In the International Ltd. All are published by IPC Business Press Ltd.

John's 1150





Jones

THE UK Public Sector is a vitally important market for our office systems firms to capture if they are to prosper, but spending cuts, red tape, and union restrictions are all obstructing the automation of local government.

Frank Jones, a management services officer with Bradford Metropolitan Council and a pioneer in the introduction of large shared-logic word processors to the Public Sector, describes how councillors are being caught between the devil of union militancy and the deep blue sea of government cut-backs.

# How word processing could help councils to beat cuts crisis

By Frank Jones

THE clouds are beginning to blot out the futuristic rays of the office automation future for the United Kingdom.

The hopes of the previous and present governments were that North Sea oil would allow the UK to develop new products and markets whilst in economic decline.

Because of cheap Third World labour, high technology was one of the few areas where we remained competitive internationally. Office automation with its silicon chip and software reliance has certainly become one of the largest single technological development areas and one of the most attractive for exports.

It was hoped large scale public and private sector investment in office automation would attract investment in manufacture and software development within the UK as at least a proportion of the sales for investors would be local. However, a number of factors are contriving to abort our salvation.

The trade unions are mustering their members not to prevent the introduction of office automation, but certainly to make it difficult, less cost effective and protracted.

One could argue, perhaps justifiably, it was their job to protect their members and they were only exercising their prerogative.

The cataclysmic results of the difficulties they could create by irresponsible action, however, can clearly be demonstrated by the Swiss watch industry. They ignored investment, remained undeterred by technological development and the end results were the collapse of their industry as the US and Japan attracted their customers with new microprocessor based products.

But trade unions are only one contributory factor to an aborted future.

The government, gifted though it may be in stimulating confidence for our economic salvation by trying to reduce

public expenditure, may, in my personal view, be counter-productive following its proposed reductions in the rate support grant for local authorities.

Normally, the grant has few strings attached to it so local authorities with reduced grants can economise in any way they see fit.

The recent Department of the Environment circular indicated a £300 million reduction from the £900 million grant with future possible reductions if higher pay is awarded to workers.

The intention is clear: reduce staff, increase efficiency and spend less money for the same or an improved service.

But can or will local authorities get the message? I think not.

If we take Bradford Metropolitan Council, for example, approximately 50% of income of the £188 million gathered was the rate support grant for 1979/80. More significantly, 74% (or £80 million of £112 million) was net expenditure.

The intention to reduce by, say, 3.5% of the £80 million means that approximately £3 million will need to be trimmed off the budget this year.

If we took a national cost of £1,000 per employee, the council would have to reduce by 1,000 jobs to achieve their saving.

Any guesses what the trade union reaction would be of, say, Nalco, which has 4,000 members in Bradford, was asked to reduce the labour force by 25% overnight with no increased benefits to members?

So, as a politician seeking re-election next time, these are your options: increase rates and probably lose the election; reduce dramatically staff and services and probably lose the next election; or reduce staff dramatically and by introducing office automation maintain services but anger the unions by the speed of change, or, reduce your capital expenditure, injure long term efficiency but hope to stay in power to retrieve the situation.

It is a brave man who chooses anything other than the latter of these courses. So with a declining capital expenditure and a growing proportion of revenue expenditure what happens?

The current pattern of 83% spent on wages and running expenses and 17% spent in capital expenditure — with a 30% reduction — in little more than five years would leave no capital expenditure and committed revenue to personnel.

As the major employer (the public sector) was not investing in technology in the office there would be little point in venture capital companies investing in factories in the UK to attract local sales.

So what would happen — is what has already happened — the US would have Third World countries assemble their products cheaply and they would then export them to our more adventurous private sector companies.

Eventually, in the sixth or seventh year, councils would have to start reducing services by sacking staff and as the com-

munity did not have any new forms of employment further demands on the public purse would be made.

A Catch 22 decline would have been entered into.

But surely, you may argue, officers would advise politicians against such a course of action. I wonder?

Most local authorities, following the Bains Report, built strong personnel sections who introduced job evaluation schemes. The schemes themselves were an attempt to rationalise the grading of personnel in the organisation. A laudable objective in itself.

Nearly all the schemes were on some form of points rating relating to a number of characteristics to the duties to the post.

For example, a manager having responsibility for 40 solicitors would receive points for the number of employees and the complexity of the task performed.

Nowhere in the scheme does it attempt to measure if the solicitors are effective or if the person is suitable to the post. Almost with naive pride, personnel officers inform us it is not the person but the post that matters. So, along comes office automation. A series of programs are written for a microprocessor system which eliminates the work of 38 solicitors.

Two clerks replace the other two solicitors and now only the very difficult un-programmable decisions are referred to the manager.

Your personnel officer

How many companies would even contemplate investing in an office automation industry... where there is a positive disincentive to politicians and managers.

revalues the post and, because the manager has less staff to manage and they are less skilled, he is down-graded.

The fact he was a genius and redesigned the organisation to meet his employer's objectives is only a personal factor and not attributable to the post. Would you recommend office automation in these circumstances as a local authority manager?

A far fetched scenario? The microprocessor has been with us since 1971. How many office products are driven by a UK microprocessor. None. The only microprocessor made in the UK is the Ferranti F100L used mainly for defence projects.

How many companies would even contemplate investing in an office automation industry in the UK where there is a positive disincentive to politicians and managers?

So how can Mrs Thatcher's government reverse the trend? I attach strings to all reductions such as: reductions must be by increased efficiency, by reductions in unnecessary administrative staff and sales of administrative buildings to meet reductions will result in further cut backs.

2. Instruct all public bodies to review their job evaluation schemes to establish: cost centres for personal achievement and reductions in manpower whilst meeting objectives means a higher not lower grade.

3. Provide the unions with a rational deal for accepting office automation: provide grants for councils to carry staff for, say, a year in order that they may be retrained; provide unions with retraining centres with government sponsored courses in information based technology; reduce the retirement age for men to 60 in each public sector that accepts office automation; reduce the working week to 35 hours; increase the holidays of staff in line with other EEC countries; set levels of change to full automation over five years with government backed employment safeguards; create new information jobs in public sectors (then market your product); expand our educational system with more sabbatical courses for middle managers over 30 and retraining for staff who find the machines in the young jobs (with security of a job after training); and make it more attractive to two parent families for only one to work part-time (alter tax system to take into account the number of hours people work).

4. Help UK based office products: set a 25% grant for installing any UK manufactured microprocessor based product; make all microprocessor based products VAT zero rated; and, ignore the regionalisation grant system and provide grants to anybody who will build office products in the UK for, say, two years.

5. Encourage public sector employees to use office products by: making Chief Executives accountable for the five year office automation programme; fire any Chief Executive who does not meet minimum office automation objectives; increase automation objectives; pay to Chief Executives who exceed minimum office automation objectives; and, provide assistance to public sector employers to hire consultants to evaluate office automation potential, provide assistance in implementation and train staff.

You might well be asking yourself, with such drastic measures, do I believe Mrs Thatcher will adopt them and save our automated future. The answer is, maybe.

I certainly believe she is more likely to tackle the root problem than the previous government. You never know, she may give me a ring tomorrow — rather than set up another working party.

## Dol denial

DESPITE doubts expressed by the electronics industry about the various government support schemes for microelectronics, a Department of Industry spokesman said last week that they were all operating "extremely well and going like a bomb". The well and going like a bomb, the spokesman said, from the impending government review of expenditure in this area.

## PRODUCT NOTES

### General purpose analyser from Hewlett Packard

A GENERAL purpose analyser is now available from Hewlett Packard, for the design of digital systems. Called Model 1610B, it is a logic state, keyboard controlled analyser, and features include multi-qualified clocks for

analysis of multiplexed buses. The clocking capability introduces three data capture modes, 32 bits, 16/16 bits and 16/8/8 bits. In addition, the 1610B can also be set to display the contents of the analyser memory even when all

the trigger conditions are not set or a system clock fails.

Data can be strobed into the 1610B with either or both edges of each of the three clocks. The slave clock strobes data into holding registers and the master clock strobes all data into holding registers.

Another function is a memory retrieval mode, which gives access to the contents of the analyser memory even if a trace point has been generated as in the case of a system clock failure.

For hard copy record of test and format and trace specifications, the HP-1610B includes an output that is compatible with the company's 9865A and 9868B thermal printers. Both produce page-width prints and simple plots at 240 lines per minute.

Hewlett Packard Limited (CW), King Street Lane, Wokingham, Berkshire, Tel: 0734 784771.

### Low cost 225 chps printer

COMPRINT's Model 912 is designed to meet the need for low cost printers in small business systems, home computers and message networks. The unit writes 80 column lines at a speed of 225 chps.

The print medium is a unique 9 x 12 pinhead matrix,

that generates overlapping dots to create more fully formed characters. A full six month warranty is offered on the Model 912, and the unit is automatically tested and fully burn-in before shipment.

Computers Printers Intern-

ational (CW), 280 Polaris Street, Mountain View, California, 94043 USA.

### Clock

THE latest addition to the PCA Minicore range is the wall fitting Clockpack, which incorporates an easy to read clock face and twin high grade precision instruments recording temperature and humidity.

The clock is battery powered and requires no electrical installation. Fitted with a quartz movement ensuring accuracy, it will give up to two years service on a single long life battery.

It costs £35.95, including VAT.

PCA Data Processing Accessories Ltd (CW), 15 Greycoat Place, London, SW1, Tel: 01-222 6222.

### Mini keyboard

ONE third of the size of a normal keyboard, the Apex 8 bit Aschi trimable keyboard is engineered to perform like a full size unit. Available in ASRS3 format, alternative codes and layouts are easily implemented. The keyboard is manufactured by Apex Microsystems, and Walmore

Electronics are the sole UK agents of the unit. Called the MK101, the unit is fully TTL/MOS compatible and features reliable and positive tactile switches.

Walmore Electronics (CW), 11-15 Botolph Claydon Street, Drury Lane, London WC2, Tel: 01-461 8011.

### For ICL users

USERS of ICL XBM communications protocol can now have remote printers in excess of the 132 columns width limit. These units are supplied by Dacell, and can be intelligent terminals or keyboard printers with paper tape reader and punch. The intelligent terminals are supplied with VDUs and floppy

discs. The specification of the printer is 184 columns at 10 characters per inch 200 chps printing, tractor feed and vertical format control. Prices are from £5,800.

The Dacell Group (CW), Dacell House, Garsden Lane, Balgrave, West Lothian, Tel: 0506 56565.

### Nashua discs

NASHUA has announced a range of hard disc cartridges for top loading drives featuring the 0.075 inch disc. Using 405 cylinders, the cartridges are certified at 4,400 bits per inch and 200 tracks per inch.

Known as the Nashua Model 4442 series, the discs have a magnetic ferric oxide coating with oriented particles and Nashua's coating formulation. Datasheet. The discs are protected by a protective disc against head crashes without interfering with read/write characteristics.

Three versions of the 4442 are available: 10 Megabyte, 125 Megabyte and Datapoint 8374 drives.

Nashua Computer Products (CW), Cory House, The Ring, Bracknell, Berkshire, Tel: 0344 88711.

### Punch

WESTER Data Processing Services offer a range of three hand punches in the Metro Data series. These are the Economy 80, the De Luxe 80 and the Metro Data 80 column verifier, which uses electric operation. Prices are from £185.

Webster Data Processing Services Ltd (CW), 68 Watling Road, Bromley, Kent, Tel: 01-461 8011.

### CADC review

THE work of the Computer Aided Design Centre in the fields of chemical process and equipment design is described in a new brochure produced by the centre. It is available in French, German and English versions from CADC, Madingley Road, Cambridge, CB3 0HE.

### Hand-held computer

A PROGRAMMABLE calculator, complete with a user-definable keyboard and memory allocation, has been announced by Hewlett Packard. It is designed to receive a series of optional add-on devices. The HP-41C has a 12 character alphanumeric display and is the first from Hewlett Packard to use liquid crystal displays.

The functions of the keyboard can be easily changed to gain access to a total of 130 pre-programmed mathematical and scientific functions or a combination of these and personal routines programmed by the user.

Other features include an

### Dual drive floppy

COMARK has announced the 730 dual drive multibus floppy disc subsystem which includes an interface, five feet of cable and dual Shugart floppy disc drives in a 9 1/2 inch chassis.

Each drive features a unit select switch to allow selection of either drive as logical unit. "O" A WRITE PROTECT switch is also included on each drive to prevent

accidental erasure or overwriting of master diskettes. The system is available as either single density (BII) or double density (BIII) and is compatible with a 10 inch rack mounting variant is optional. It costs £3,495 and delivery is between 30 and 60 days after receipt of order.

Comark Corp (CW), 257 Cromwell Street, Waltham, Massachusetts, 02154, USA.

## Video training

FOUR video training modules on time sharing option have been released by Edutronics McGraw-Hill, the first in an overall TSO training series for applications programmers and data processing managers. TSO is a software package designed to improve programmer productivity by providing a simple conversational technique for managing data sets.

The modules cover the functions of TSO and relate them to specific parts of the operating systems. The naming and referencing of data sets and descriptions of the creation and modification of data sets using the EDIT command.

Edutronics/McGraw-Hill (CW), 55 Corporate Woods, 9300 West 118th Street, Overland Park, Kansas 66210, USA.

## Return of Sentinel

BUSINESS Aids has reintroduced the Sentinel, one of its Auto 5 range of compact auto shredders. Finished in teak veneer and mounted on casters, the Sentinel is capable of shredding up to 10 sheets at a time and can also handle card, light board, carbons, film and plastics.

It is available with shred widths of 2mm, 4mm and 6mm. Fully automatic in operation, the Sentinel machine head is fully guaranteed for two years. It costs £255, plus VAT.

Business Aids (CW), 3 Watney Avenue, London, NW10.

## £1,000 minifloppy

FOR under £1,000 the Minimate from Zygol Dynamics provides the same storage capacity as Datamate, the device's immediate successor in the range. The BS 232C compatible minifloppy disc storage and edit terminal is designed as an attachment to CRT or hard copy terminals to handle storage applications.

The Minimate provides over 71,000 characters of working storage. It is capable of communicating with a host computer in either batch or interactive mode at speeds of up to 3000 baud. Minimate's character edit features include backspace erase delete and link and stop.

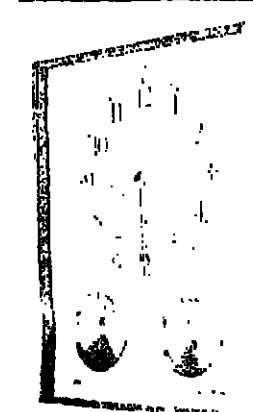
Zygol Dynamics, Bank Chambers, 12 High Street, Chesham, Bucks. Tel: Chesham 75801.

## Planax Optimer

FOR binding computer print-out, or for office use where relatively short binding runs are required, the Planax Optimer provides bound volumes complete with wrap around covers.

Optimer strip material is supplied in A4 sheets consisting of three strips of 60mm each. Choice of quality and colour of the cover board are at the discretion of the user.

Planax Binding Systems (CW), 15-17 Chem Road, Sutton, Surrey. Tel: 01-443 4411.



## 19 inch rack mounting VDU

BURST 1911 Electronics has introduced the BH 721 video terminal, a 19 inch rack mounting version of the company's established BH 720 terminal, offering the same features when used with the optional free standing keyboard.

It claims that the main advantages are also seen with underline facility, graphics capability and simple cursor control.

The BH 721's 12 inch CRT

will display 25 lines of 80 characters. It includes text underline, blink and invert facilities in any combination. Any character can be protected.

A graphics function is provided and the graphics system also provides line and point erase, addressable cursor and for the display of all control codes as well as a unique function which can be used to return the cursor to the position it was in before use of the

entire address facility. Burst 1911 Electronics Ltd (CW), Helder Road, Aldershot, Hampshire, Tel: 0252 313701.

## Vatman calculator

THE Vatman Mini VDU from Decimo is a 10 digit liquid crystal panel and display calculator, which has all the features of a desk top model, but is compact enough to be carried in a brief case.

Features include full four key memory data printing facility and an entry counter. Switchable facilities provide six setting decimal point positioning, accumulation of mixed calculations and print off for extra economy.

The calculator can be powered by standard pen light batteries or an optional mains adaptor. It uses standard sized paper tape rolls.

Decimo Ltd (CW), Park House, 4-16 Chubbam Street, Luton, Bedfordshire, Tel: Luton 38881.

## Base Ten system

A PORTABLE data requisition system designed for in-vehicle recording of large quantities of data from many types of transducer, has been introduced by Base Ten Systems.

Known as the Portable pDAS, the basic system can handle up to 98 analogue and digital outputs, including low level strain gauge as well as high frequency vibration signals. The portable pDAS unit can also be supplied with capacity for expansion in

signal conditioning. Base Ten can provide a data-analysis system incorporating a DEC PDP-11 series microcomputer, with peripherals and software. Alternatively, a telemetry link can be used in the vehicle with the receiving equipment installed at the data analysis station, to allow on-line analysis of the experimental data.

Base Ten Systems (CW), 12 Eelmore Road, Farnborough, Hants.

## Answering service

FEEDBACK has launched Logatel, a low cost telephone answering ancillary that records and displays the telephone numbers of callers to unattended telephones.

Using microprocessors, the unit can sit in front of a standard telephone receiver. It measures 237mm x 65mm x 27mm yet it can store 10 ten digit numbers.

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By simply touching a switch, the recorded telephone numbers are displayed one after the other when the person returns to his desk. The Logatel unit connects directly to the standard telephone output.

Feedback Ltd (CW), Park Road, Croydon, Surrey, Tel: 0892 31222.



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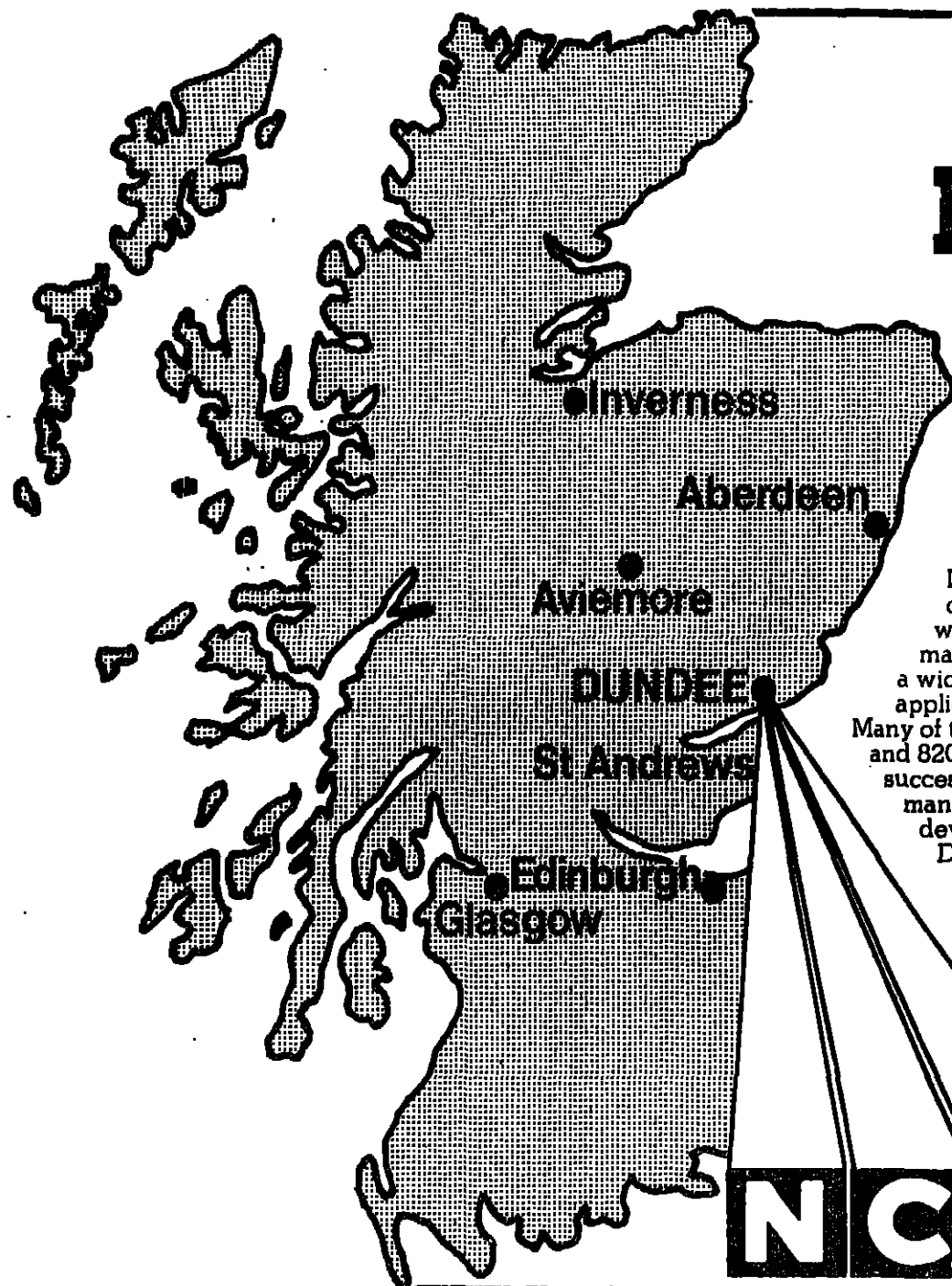


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Application forms are available from: The Recruitment Officer (JD871/3), The Open University, P.O. Box 76, Milton Keynes MK7 9AL, or telephone Milton Keynes 63464. There is a 24-hour answering service on 03685 3232.

Closing date for applications: 13th September.

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## Royal Observatory, Edinburgh Software Specialists Scientific Officers/ Higher Scientific Officers

There are vacancies for software specialists at the Royal Observatory, Edinburgh.

The Observatory is responsible for three major national facilities — the 1.2m Schmidt telescope in Australia, the COSMOS high-speed measuring machine at Edinburgh and the 3.9m infrared telescope in Hawaii. All facilities employ software specialists for developing control system software (for controlling telescopes, telescope instrumentation and high-speed measuring machine) and for developing scientific applications software for the reduction and analysis of data.

Initially, the successful applicants will be posted to the U.K. Infrared Telescope Unit. This 3.9m telescope is the largest of its kind in the world. The telescope and the ancillary instrumentation are controlled by two PDP 11/40 computers. The successful applicants will be responsible for the support and development of the telescope operating system, written in assembler, and the instrument control systems, written in higher level languages.

Applicants for these posts should have experience in one or more of the following fields: assembler language programming, FORTRAN, real-time software, and scientific applications packages or microprocessor systems. A good degree in Mathematics, the Physical Sciences or Computer Science is essential.

Because the telescope is situated at high altitude a special medical examination is given to all members of the UKIRT operating team on Hawaii. Success in that examination will be a prerequisite for appointment to this post.

Salary will be in the range £4218-£6211 (under review) depending upon age and experience. Non-contributory superannuation scheme.



Application forms and further details from: Personnel Officer,  
Royal Observatory, Blackford Hill,  
Edinburgh, EH9 3HJ. Tel: 031-667 3321.  
CLOSING DATE: 21 SEPTEMBER, 1979.

## Public Health Laboratory Service

### Team Leader

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The Public Health Laboratory Service already using the latest in computer technology and processing units of the potential future application of data processing in the laboratory. The service is now looking for a Team Leader to control and develop our newly formed Data Processing Unit. We provide a microbiological service to some 60 laboratories throughout England and Wales and are also responsible for two major research establishments in Porton Down, Wiltshire, and Colindale, North London. As Team Leader you will essentially be bringing under centralised control those computer projects already operating together with those planned for the future. Towards this end a C.I.L. computer has already been installed at Porton Down in the form of the Data Processing Unit. Your responsibilities for the unit will cover the full range of staffing, systems and financial control. You will be based with our headquarters team in pleasant offices in Colindale, NW9, though your work with some medical and scientific staff will also involve travel throughout the country. There is a high level of challenge and the unit is the central of an exciting new project. Naturally you will need to be well qualified technically and possess the managerial and personal qualities necessary to make this venture a success. Further details of the post may be obtained from Dr. R. A. Bassett, Public Health Laboratory Service, 61 Colindale Avenue, London NW9 5EQ (Telephone 01-206 1295) to whom an application together with the names and addresses of two referees should be submitted by 28th September, 1979.



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Please quote ref. no. TR/540 in all correspondence.

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For an application form, please write or phone Mrs. Janet Betterman, A.C.C.A.,  
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City Treasury

## Senior Systems Analysts/ Cost Accountants (2 Posts)

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Mr. L. T. Richards, Halfords Limited  
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or just call in to see us for an informal discussion (no appointment needed) at either of the following:

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For further information on any of the above vacancies, please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

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32 Savile Row, London W1 Tel: 01-459 9311

### Project Manager

City to £9,500 + mortgage  
Our client, a major international corporate bank with many EDP systems, which are either under development or in use, is seeking to appoint an experienced individual to help maintain the high standards required in its London office. As a senior member of a small team, you will be expected to make a significant contribution to both development and maintenance of new business applications. Applicants must be well educated and should possess two years' project leading experience ideally gained in a financial environment, while a sound knowledge of RPG11 (Sys 3) is mandatory. In addition to the competitive salary, the bank provides a comprehensive range of benefits, including low-interest mortgage facilities, non-contributory pension, life and medical insurance plans and an interest free season ticket loan. Contact: Margaret Stevens

### Sales Executive

Midlands and North up to £7,000 p.a. + Commission + Co. Car  
A small mini-computer systems company, with an impressive growth record, requires a sales executive to expand its business in the Midlands and North of England. The successful applicant will have complete responsibility for selling computer hardware and standard or customized software and will report direct to the Managing Director. Candidates should have several years' good experience in the computer industry at either a sales or a technical level. Selection will be based on personality coupled with the ambition to succeed in selling. A challenging ground floor sales opportunity with lots of scope for an achiever. Contact: Bev Stevens

### Customer Support Specialists

Berkshire up to £7,000  
Our client, a small but dynamic systems house, is expanding its Customer Support team to cope with the increase in business and is looking for experienced staff to work on real-time turnkey projects. Applicants should have a sound background in computing with at least two years' experience in the development and programming of special real-time turnkey systems using mini or micro-computers. Ability to take a project from initial order to final customer acceptance is essential. Additional experience in project management or training would be an asset. Salaries are negotiable and are not likely to be a limiting factor for candidates with the right experience and potential. Contact: Jim Baker

01-459 9311







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### SENIOR ANALYSTS

should be capable of planning and developing system projects with responsibility for teams of analysts and programmers. They will operate fully at the User level of middle management and will need to be able to communicate effectively from both a business and technical viewpoint.

Sound commercial systems expertise is essential together with a proven project record and the successful applicants can look forward to a progressive future with the opportunity to gain senior project management experience.

Our Client is an international market leader in its business area and offers the people appointed a progressive career prospect. The competitive commencing salaries are further enhanced by the package of large company benefits, and some opportunities exist for travel within Europe.

The

### SYSTEMS ANALYSTS

will be responsible for the design and development of international projects. They will also liaise closely with senior project staff and User Management to ensure timely project development schedules.

Candidates who can offer a sound technical and business background will be able to utilise their experience to extend their own career development in an organisation committed to personal advancement.

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There are several vacancies, all brought about by new product development. Salaries are very competitive (i.e. to £7,000). Conditions of employment generally are excellent and a generous relocation package is offered where appropriate.

If you are a graduate with up to 5 years experience in

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- I/O device drivers
- COBOL on micros
- 8080 Assembler

then write, with brief personal and career details to:

Ian Hume,  
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NCR Ltd Engineering & Manufacturing,  
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Dundee DD1 9XW.



## MARCOL'S ICL & IBM DIVISIONS are under pressure

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The main area of interest will be for solid Cobol programmers, or analysts with a Cobol background to work on various applications including:

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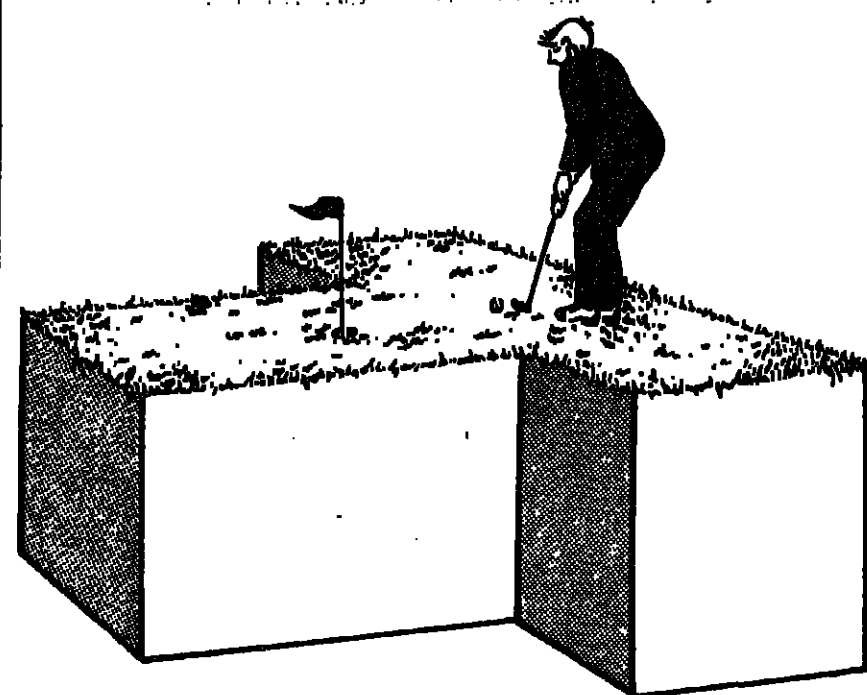
You will also be thoroughly technically interviewed and briefed prior to meeting our clients.

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Total capability from the Group  
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Some programming jobs are great for money, but the work itself is boring. Others are really interesting, but there's nothing to do in the area outside working hours. It's not often you find all three key factors combined.

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You'll earn good money, and regular reviews and appraisals means you'll stay in front. What's more, because the company is expanding so fast, and because it believes in promotion from within, the odds are you won't have to look around for your next job. We'll recognise your abilities and move you up the ladder right here.

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Interested? Contact Sue Horner, Personnel Officer, Tesco Stores Ltd., Delamare Road, Cheshunt, Herts, EN8 9SL. Telephone: Waltham Cross 32222.

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## Programming Manager for major International Project London based

Planning Research Corporation is a \$250m international consultancy with interests in the commercial, industrial, Governmental and military fields. At present our Management Sciences group is undertaking a major expansion programme in the UK, Europe and the Middle East.

Our first projects are under way, and as a result we are setting up a major Cost Information System supporting, planning and budgeting for the total construction of two new cities in the Middle East. The system is based on IBM 370s in London and on site.

These projects have led to a need for a programming manager to oversee the design, installation and commissioning of the programs required. Ideally, applicants will be Analyst/Programmers with 5 years' experience — preferably with a minimum of 2 years' supervision of a team of programmers coupled with proven experience of systems analysis and design. A scientific or engineering background is desirable. Systems experience must include good knowledge of Fortran, OS/VS1 or VS2, and TSO (with experience of writing/designing CLISTS).

The appointment will be based in Central London but travel to the Middle East will be required as necessary.

The proposed salary will be c.£8500 but will not be a limiting factor for candidates who match our experience/qualifications profile exactly.

We are being assisted by Charles Barker-Coulthard who are conducting initial interviews.

Please write with full details, or telephone for an application form quoting reference 466/6 to  
Charles Barker-Coulthard Limited,  
30 Farringdon Street, London  
EC4A 4EA. Tel: 01-236 0526.

**prc**

Planning Research Corporation International

## COMPUTER WEEKLY DP Opportunities in Banking & Insurance

### Special Feature September 6 Issue

The September 6 issue of Computer Weekly — Britain's largest circulated computer publication will contain a special feature outlining the career opportunities and employment prospects open to data processing personnel in banking and insurance.

The shortage of experienced DP personnel has been a major problem for employers during recent years and this is likely to remain the case for some time to come.

A career in banking and insurance offers considerable scope for experienced personnel. This feature, one of several covering a variety of subjects, is geared to create a greater awareness amongst readers of those key areas of opportunity and at the same time, provide advertisers with the additional impact features secure.

Computer Weekly is the natural choice for recruitment advertising and always has had the highest circulation of any journal in the computer industry. Current average circulation has now risen to well over 90,000 with almost 25,000 more personally requested copies than the nearest competitor.

The combination of this special editorial feature and Computer Weekly's large penetration amongst analysts, programmers and operations staff etc, provides a first class recruitment advertisement platform.

Recruitment advertisement rate is based on £12.00 per scc and copy instructions should be received by Monday September 3.

**COMPUTER WEEKLY**

THE INDUSTRY NEWSPAPER FOR THE DP PROFESSIONAL  
Published by ITC Electronic Press Limited, Dorset House, Stamford Street, London SE1 9LL  
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Informatics Inc. is one of the major U.S. Systems houses with a truly International activities base. In Europe and the U.K. Informatics has experienced an impressive expansion over the past 18 months to the point where it anticipates doubling its manpower resources within the next year.

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Currently we are seeking personnel with backgrounds in Commercial and Scientific applications. The former will normally involve T.P. and Data-base projects and the latter will be involved in Telecommunications, Real-time process-control and scientific applications.

Informatics will offer you well above top market salaries, International travel, first-class fringe benefits and invites you to attend an expense paid interview during the week commencing September 3rd Phone Karen Whelan or Gordon Brown on 01-405 8546 (reverse charges accepted).

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As a highly successful Company with diverse interests, we are constantly seeking to develop our inner strengths in order to push for that ever distant goal of perfection.

We firmly believe that our advanced computer installation is one of our major strengths and that the effective use of our computer resources is vital to our continuing growth.

With control being the key word, we are seeking to appoint a Manager to co-ordinate our computer resources. Heading a small team engaged on liaison between users and computer services, the successful applicant will be primarily responsible for accepting the integrity, feasibility and security of all new systems. This could involve technical considerations, manpower and machine availability as well as software and operations capabilities.

Although we are prepared to be flexible in our appreciation of individual talents, obviously, a sound data processing knowledge is essential. Perhaps the ideal background would be to have attained programming management status with good exposure to systems and operations functions. In all instances it will be essential to possess the ability to interpret technical jargon into terms easily understood by the layman user.

Adaptability is essential as you could act in a multitude of roles, perhaps as a Consultant, Planner, Watchdog, Training Officer and not least a line Manager. Obviously considerable emphasis must be placed on possessing the personality necessary for successful man/machine interface.

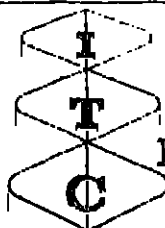
Excellent benefits are available including a generous relocation package. If you feel that you possess the attributes we are seeking, contact our Advising Consultant:

Martin Stainthorpe on: 021 236 3781 (24 hour answering service)  
or: 021 744 1862 (evenings and weekends)

Interviews to be held in London, Birmingham and Manchester.

#### Specialist Computer Recruitment Ltd

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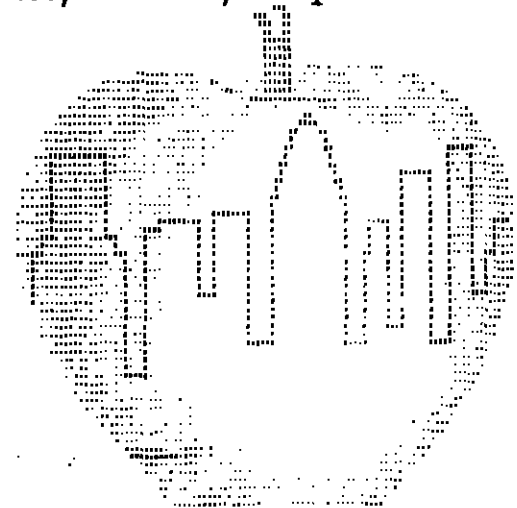
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Excellent salaries and conditions. Full training and career progression. **PERMANENT STAFF OR FREELANCE**  
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**QUEEN ELIZABETH COLLEGE**  
Kensington (University of London)  
**MICROPROCESSOR DEVELOPMENT OFFICER**  
Applications are invited for a newly created post of Microprocessor Development Officer within the Computer Unit. The Officer will be responsible for the design and development of microprocessor based systems. The successful candidate will be required to have a minimum of 3 years' experience in microprocessor applications, and in particular working on a small number of specific research projects with a view to developing a new microprocessor based system. The successful candidate should be enthusiastic in an appropriate discipline (e.g. physics, computer science, electronic engineering) with experience of both analogue and digital electronics and microprocessor systems. A relevant higher degree would be an advantage. For a full description of the post and to apply, please send a curriculum vitae to the Director of the College, Queen Elizabeth College, Campden Hill Road, London W8 5AH.

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Programmers urgently required for industrial and scientific development.  
£3,500-£5,000 p.a.  
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New York. The Big Apple. Ripe with opportunities for people in the computer industry. Right now, offering unrivalled experience in the most sophisticated business and financial environment in the world.

Our client, Computer Technicians Incorporated - Systems Division, a U.S. based consulting firm, is looking for Programmers and Systems Personnel to join a major U.S. bank, located in the Wall Street area of New York City.

Candidates for these permanent positions must have a knowledge of IBM and/or NCR systems. Vacancies exist for:

**PROGRAMMER ANALYSTS**  
with a minimum of 3 years' experience.  
**SYSTEMS ANALYSTS/PROGRAMMERS**  
**SENIOR SYSTEMS ANALYSTS**

If you're tempted, simply telephone 01-937 8241 to arrange an interview, or apply in writing, with a full curriculum vitae to:

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Personnel & Recruitment Consultants  
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Jobs from £3,500 to £8,000 in all areas. Phone now for a free list of vacancies.

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# There are many heights one can reach for in the City.

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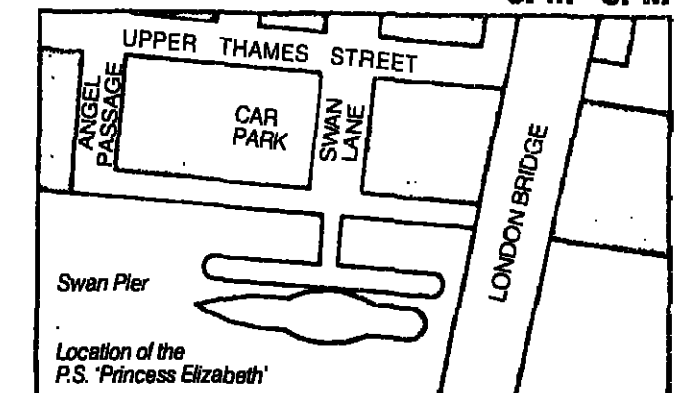
CMG's reputation in the City is second to none. We have been providing services to the financial sector for more than ten years and during that time we have grown to become one of the largest independent computer services companies in Western Europe. We feel confident that by the mid 80's we will be a £100 million business. Because of our excellent reputation we are committed to employing the best people and therefore, are prepared to pay the best salaries plus unrivalled benefits which include:

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To meet further expansion we are now looking for experienced DP Professionals with a firm knowledge of our business areas. If you have at least 2 years experience plus a background of programming and systems analysis we'd be delighted to meet you.

**Informal interviews  
September 3**

**Paddle Steamer Princess Elizabeth,**  
Swan Pier, Swan Lane, London Bridge, EC4.  
5PM - 8PM



(3 minutes walk from Monument Tube and 5 minutes from Cannon St. B.R.)

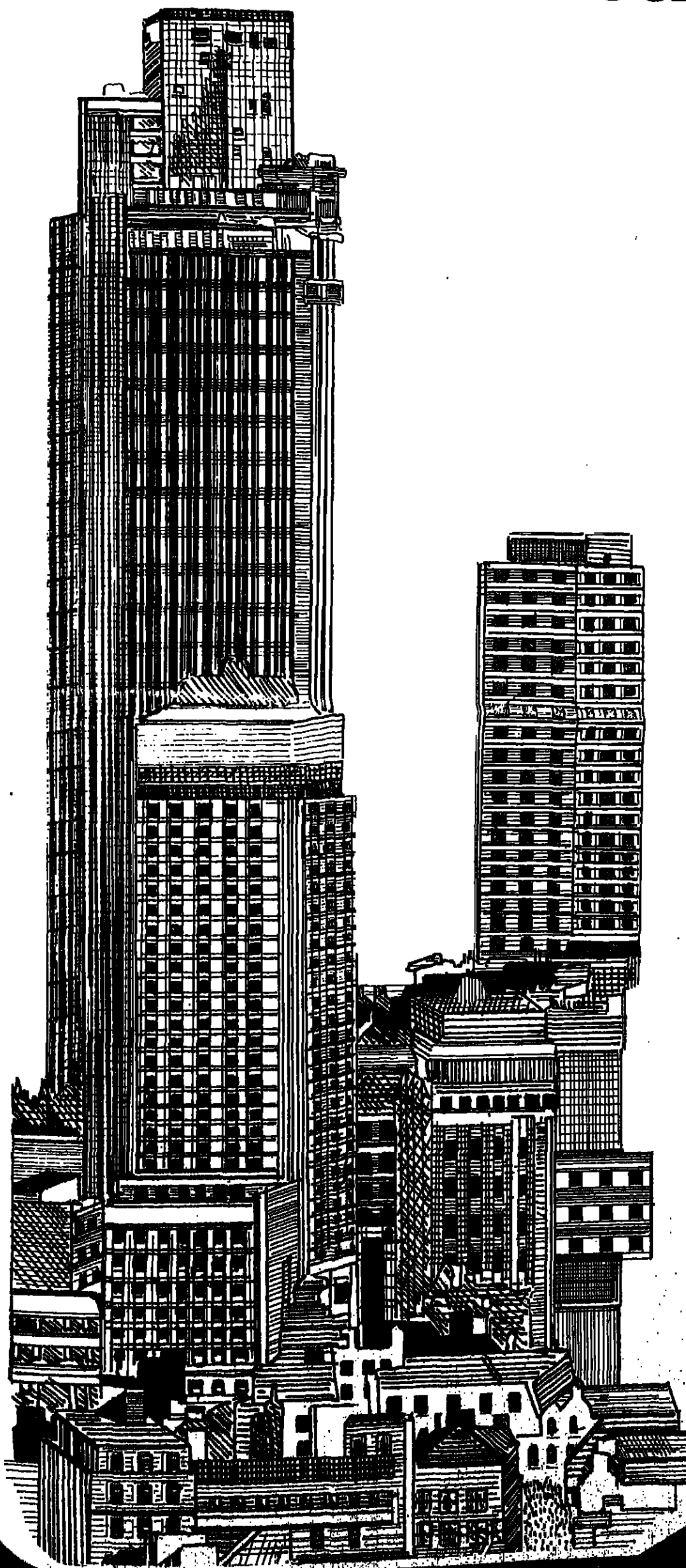
If you can't come along please write or telephone, quoting ref C3, to:-

**Chris Hennessy,**  
CMG (City of London) Ltd.,  
Eastgate, 73 Leman Street,  
London E1 8EY, Tel: 01 481-3881

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## O&M Opportunities in Hackney

### Principal Project Officer

(£7128-£7830) Inclusive of pay award, subject to local ratification (Ref. E155/CW)

To carry out O & M type assignments with particular emphasis on those requiring expertise in the fields of modern office systems and technology. There will be ample opportunity to develop a leading role in those areas, under the general guidance of the Assistant Chief Manager Services Officer. You will work directly with staff and management at all levels and will therefore be required to show the necessary maturity of approach.

A degree and/or professional qualification is required.

### Project Officer

(£5721-£7437) Inclusive of pay award, subject to local ratification (Ref. E155/CW)

This post requires a minimum of two years' experience in the O & M/Management Services field, in order to carry out a wide range of assignments. The anticipated starting salary will be up to £6048, within a career grade structure. Qualifications are desirable but aptitude and personality are qualities primarily sought. There are good prospects for advancement within the manpower services field.

For further details and application form, please write to Head of Borough Personnel and Secretarial Services, Town Hall, Mare Street E8 1EA, or telephone 01-986 9278 (24-hour answering service) quoting appropriate job reference. Returnable by 14 September.

An Equal Opportunity Employer.

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LUDWIG INSTITUTE FOR CANCER RESEARCH (LONDON BRANCH)

## COMPUTER PROGRAMME RESEARCH ASSISTANT

The clinical and laboratory team engaged in a programme of research designed to assist in the better management of breast cancer need a RESEARCH ASSISTANT to undertake processing and classification of patient data and storage in PDP11 computer.

The appointment, which would extend for three years in the first instance, should be of interest to younger persons with sufficient training and previous experience in data processing, and who are keen to apply themselves in a responsible and creative role.

Salary is likely to be around the mid-point of scale £4,475-£5,075.

Application, with particulars of education, training and previous experience, and with the names of two referees, should be made to the Secretary, Ludwig Institute for Cancer Research, 61/63 Avenue, Sutton, Surrey SM2 5PL.

## CITY OF LONDON POLYTECHNIC TEMPORARY LECTURER II IN SYSTEMS ANALYSIS AND DATA PROCESSING MANAGEMENT SCIENCE UNIT

Salary: £4,944-£7,523 including London Allowance plus a supplement of £6 a month.

A third person is sought to join a long-established team providing all Systems and D.P. teaching within the School of Business Studies of the Polytechnic.

The principal emphasis in the team's work is a new MSC/NCC 10-week Systems Analysis Course. The new recruit will be expected to provide a major input to this, as well as assisting the team with existing work on design, HND and professional courses of all types.

For an application form and further particulars write to the Staff Records Officer, City of London Polytechnic, 117 Houndsditch, London EC3A 7DU, quoting reference number 79/101.

## PL/1

### S. London

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Send resume to APS Ltd, 12A Lodge Road, Hamden, London, NW4 6JL quoting ref: 088

# Manager Technical Services

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Our client is one of the most advanced commercial organisations in Kuwait. A multi-national company, they are one of the largest General Motor Dealers in the world and also have interests in Electronics, Construction and Travel.

The Management Information Services Group plays a major part in the continued development of the Company. We have been asked to recruit an experienced Manager to take charge of the Technical Services area of this group. This is a highly challenging position and the successful applicant will probably have a Degree and a minimum of two years management experience, backed up by seven or more years experience in data processing.

An extensive knowledge of IBM hardware and software products is essential and candidates must be thoroughly familiar with IBM operating systems, systems analysis and programming, and both high and low level languages. Good knowledge of telecommunications is essential. The successful candidate will provide a high level of technical support to the entire MIS group and will be extensively involved in evaluation, recommendation, acquisition and implementation of hardware and software, particularly in the data base and data communications areas. The position will involve the supervision of a small team of Technicians and liaison with senior management on configuration effectiveness, and work in progress.

The position carries an extremely attractive TAX FREE salary and a comprehensive benefits package including:

- \* Furnished accommodation
- \* Free transportation
- \* 36 days annual leave
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- \* Free health and life insurance schemes.

Please send a copy of your curriculum vitae to Michael Sanick, or telephone him on 01-828 5356. Preference will be given to Arab Nationals applying for this position. Ref: 001/CW.

## John Goldsmith Computer Executives



John Goldsmith (Computer Recruitment) Ltd., Amphlett House, Palace Street, London S.W.1. Telephone: 01-828 0386 - 24 hour answering service. Telex: 918770.

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Up to £5,500 pa.

We require competent Operators to work on our installation of two 1904SS and two 2960s, with numerous peripherals including on-line equipment.

To join these teams operating a shift system covering Monday to Saturday (34 hour, average four day week) you should be aged over 19 years, with a minimum of 1 year's experience on ICL 1900 series or some 2960 experience.

You can expect to earn up to £5,500, inclusive of shift allowance. Benefits include relocation expenses, house purchase scheme, four weeks' annual holiday, non-contributory pension, free life assurance, luncheon vouchers, 24 hour staff restaurant etc.

For further details and an application form telephone Rita Sidders on 01-952 2333, or write to her at:

Bankers' Automated Clearing Services Limited, 3 De Havilland Road, Edgware, Middlesex.



## SYSTEMS ANALYST / PROGRAMMER I

Applications are invited for the position of Systems Analyst / Programmer. Candidates should have considerable experience of production control techniques and data bases, plus the ability to programme in COBOL.

Applicants should be educated to at least H.N.C. in relevant subjects.

Please apply to:

The Company Personnel Manager  
Telephone: Letchworth 8588

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## £20-£23,000 pa BELGIUM

The Howard Organisation International has an immediate requirement for the following staff:

**SYSTEMS ANALYST**  
Systems Analyst with knowledge of computerized telephone switching, traffic handling, call processing, etc. Experience in processor configuration and the ability to design software to meet the specification.

Working knowledge of PLM, SPL1, and Assembler and of Intel 8080 series and/or PDP11 series hardware a distinct advantage.

This is an opportunity for the right applicant to join a team at the start of an important international project, and can represent long-term involvement and excellent job satisfaction.

Ref: GWK 190879

**PROGRAMMER/ANALYSTS**  
A number of Programmer/Analysts are required with a minimum of 2 years practical experience in debugging real-time software.

Knowledge of an assembler language, preferably in a telephone, telex, or data switching environment would be an advantage.

We are seeking computer professionals with this experience in one or more of the following areas of application:

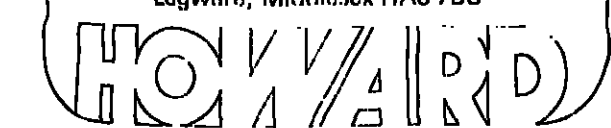
- \* Routine test
- \* Call routing
- \* Installation test
- \* Statistics

This is an immediate requirement. Therefore, if you have the stated experience and wish to apply your knowledge to a major European project, call us quoting job reference GWK 200879

Telephone: 01-952 8092

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A further Sales Executive is required to help with business expansion in the North.

If you have a proven sales record related to the computer industry and would like to hear more about the benefits and career prospects offered by Infolex then telephone or write to Derek Blackiston, Northern Regional Sales Manager, Infolex Limited, 6th Floor, Emerson House, Albert Street, Eccles, Manchester. Telephone: 061-707 1123.

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If you require personnel who command salaries of £10k and over take the opportunity of advertising in this special REGULAR FEATURE.

For further details contact:  
Mark Williams on 01-261 8028 or Mark Pulver on 01-261 8174

## SOCIAL SCIENCE GRADUATES

Applications are invited from young social science graduates for a Scientific Officer post with the Social Science Research Council.

The successful candidate will work as part of a team providing the secretariat for the Computing Committee which is concerned with the support of software development and of social science research. Applicants will therefore need to be familiar with computing techniques and problems. Knowledge of these relevant subjects would be an advantage but not necessarily at a detailed programming level.

The staff of the secretariat are not themselves engaged in research but provide support for the Committees which manage applications for grants to support research projects being undertaken in universities and independent institutions and which are involved with a variety of other matters relating to research in the field which they cover.

Applicants should normally be under 27, have a good honours degree and a genuine interest in research administration.

Salary scale £4,000-£5,800 per annum including travel allowances from 1 January 1980 £4,371-£6,265. Starting salary may be above the minimum depending on areas of degree and experience. The hours of duty are 35 per week, including lunch hours and the leave entitlement is 28 days plus 10% public and privilege holidays. The Council has its own two-centenary pension scheme.

Application forms and further details may be obtained from: Mrs. Anne Glover (Ref. 30/CW), SOCIAL SCIENCE RESEARCH COUNCIL, 1 Temple Avenue, London EC2H 8BB. Telephone: 01-262 5292 Ext. 111. Closing date for applications: 13th September 1979.

## LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (University of London) Keppel Street, WC1E 7HT DEPARTMENT OF HUMAN NUTRITION COMPUTING ASSISTANT

A Post-School Child Growth Survey requires a computing assistant to work as a member of a small team up to 30 September 1981 on the handling of data from a large longitudinal survey, with responsibility for data checking and for maintaining data files in preparation for analysis.

Applicants should be qualified in computing to HND level or equivalent, and have had experience in data processing.

The University of London Computer Centre CDC 8600 system is used.

Good salary will be in the range £1520-£4801 (under review), depending on age and experience.

Applications, consisting of full educational and career details and naming two referees, should be sent to Secretary (A1) at the School.

## CITY OF LONDON SENIOR TECHNICAL PROGRAMMERS Salaries up to £8,000

Lloyd's Register requires several technical programmers, at Senior and Junior levels, offering an interesting and demanding career.

A wide range of hardware is employed and includes Desktops, Minis and RJE Mainframes. FORTRAN, BASIC, APL and Assembler are used and training would be given where necessary. You would be encouraged to work closely with engineering staff to design and produce programs and systems for shipbuilding and offshore applications. Please telephone 708 9168 ext 632 or write for an application form to: The Recruitment and Staff Relations Officer, marking the envelope 'Confidential'. LLOYD'S REGISTER 71 Fenchurch Street, London EC3M 3BB

# Systems Support Engineer

Why settle for second best when you can work with the UK market leaders in engineering computer services? Due to an expansion of the Engineering Systems Group in London, our Clients, widely acknowledged as providing the best support service in CAD and engineering analysis, are seeking two **Systems Support Engineers**. Involvement will be in maintaining and developing software relating to our Clients' innovative products in the sphere of interactive frame analysis and finite element modelling languages. As part of a small but highly professional team, successful applicants can expect to use their technical expertise in the development and promotion of new applications, as well as providing a problem solving service within the engineering design field.

Candidates should offer fluent FORTRAN and 2-5 years experience in the design of engineering software or research into numerical methods. A degree in an engineering discipline plus a working knowledge of software applications on IBM and PDP11 machines would be advantageous. Rapid growth of operations both in England and on the Continent ensures scope for technical and managerial progression. Benefits include a bonus scheme, profit sharing, contributory pension scheme, LVs and an exciting working environment.

£8K

## Kent to £7.5K

This large and exciting company requires Assembler or PLI Programmers at all levels of expertise to join their research and development teams. Benefits include flexible, subsidised restaurant and relocation expenses where applicable.

## Paris £10-16K

A major American company requires a CICS Systems Programmer for their Paris office. You must have Assembler, COBOL and DLI and have been involved in the implementation of new CICS releases. Working knowledge of French is essential.

## W. London-V.R.C.

This manufacturer is seeking Assembler and COBOL Programmers with a minimum of 9 months experience. Applications include invoicing, inventory control, management information etc. Excellent career prospects. £4.9-6.7K

## IMS (EEC)

Our Client is a dynamic and forward-thinking Software House based in the Netherlands, offering projects throughout the EEC. They are offering permanent positions for achieved **Systems Design and Applications Programmers**. The experience required for these posts is at least 3 years IMS DB using DLI and PLI under OS JCL; knowledge of structured programming techniques or other database systems such as SHADON, TOTAL, ADABAS etc. would be advantageous. Project Leaders are also required for a large conversion being undertaken at a Real-time installation near Brussels; applicants should have experience of either PLI under MVS or Assembler under DOS/VS. The ability to maintain a professional presence and to work independently is important. Our Client's impressive record of successful delivery to the people who work there - if you identify with this kind of company and are looking for a positive career move, then this is your opportunity.

£12-16K

## Radar Systems-Europe

Senior Systems Designers and Senior Real-Time Programmers are required for a number of advanced projects in radar systems. This large and exciting British Systems and Software Group is seeking additional technical specialists to supplement teams in its Dutch, Belgian and German offices. These projects are right at the forefront of technology, working on advanced air defence systems in a stimulating development environment. Particular machine or language backgrounds are less important than a thorough grounding in the principles of Real-time systems, plus real-time implementation experience. Radar data processing systems experience is of especial interest, particularly at the system design level. Our Client

also offers a wide variety of long-term opportunities as Consultants, Software Specialists and Managers in an expanding international group of companies with a reputation for project reliability and quality control. The company benefits are hard to beat including relocation expenses, life and health insurance, and optional company pension schemes. Furthermore, personal involvement in a stimulating development and challenging career prospects are offered. Early interviews will be held at our Client's offices and offers may be anticipated within two weeks.

£12-18K

## Message Switching

Do you value working at the forefront of message switching technology? If so, our Clients, who are market leaders in their field, have authorised Matrix to initiate serious negotiation with a view to offering you a superlative career opportunity. Several positions have arisen within development teams based throughout S.E. England and the EEC. Matrix has been instructed to shortlist suitable candidates for the following posts: **Project and Team Leaders, Systems Designers, Analysts and Programmers**, both senior and junior. The hardware background is not particularly relevant but experience at the programming level calls for either Assembler, CORAL, RTL11, or BASIC. Relocation expenses will be met where applicable, and big company benefits are offered in keeping with our Clients' prestigious reputation.

UK-to £9.5K  
EEC-to £15K



10 Grenville Place  
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01-373 3063

## N.W. London

Our Client, a large user, is seeking Analysts and Programmers with 3-4 years programming/systems experience and a sound Real-time background to work on an advanced configuration PDP system under RSX 11. Promotion prospects are excellent and large company benefits apply. £6-7.5K

## Fortran £7K

A leading Bureau with international connections is seeking Fortran programmers with at least 2 years experience to work in their Surrey offices. Knowledge of finite analysis, modelling and forecasting applications would be an advantage.

## S/W Instructor

Graduates with at least 3 years in programming and design are required to undertake a wide variety of training activities in a high level environment with enviable facilities. Openings exist in London, Essex and Berks. £5.5-7.5K

## Fraser Williams Computer Consultants

LONDON, TORQUAY, NEWCASTLE, MANCHESTER, BIRMINGHAM, SHEFFIELD, GLASGOW



# THE ROLE THAT GIVES REAL FULFILMENT TO ANALYSTS AND PROGRAMMERS IS IN CUSTOMER SUPPORT

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- ★ The function of these groups is to produce custom-built solutions to individual business problems. The computer facilities available to customers are among the most sophisticated to be found anywhere. They are used by a very broad spectrum of companies across the world. This provides not only project variety in both size and complexity for customer services personnel, but also gives a first-class opportunity for career development.
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- ★ The opportunities exist in:  
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If customer satisfaction can satisfy you, then ring **MIKE TAYLOR** on **01-499 4501** or write enclosing career details. (Ref. CW 35/1).

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If your earnings package is better than ours we'll come and join you!

We wish to expand our small professional company through the addition of a Recruitment Consultant who has a proven track record in the UK. We know there aren't many of you to recruit from: what we do believe is, if you are the person we are looking for, then we have a lot to offer you.

The success of our company depends on the quality of its people and our remuneration package reflects the desire to recruit and keep the best in the business. In addition to high financial rewards, we offer the kind of professional independence that will appeal to the successful, mature person.

If you are successful with us, your planned career progression will include a Directorship.

Ref. CW 35/3

Please call **DAVID J. HUTCHINSON** on **01-499 4501 (day)** or **01-643 3233 (evenings)** for a confidential discussion.

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A new launch by this well-established multi-million dollar D.P. company has determined the creation of a new support group. Reporting to a U.K. Director, this senior person will head up a small dedicated team. The responsibilities of the post encompass all traditional pre-sales functions, applied to applications software, together with the development and implementation of the subsequent systems.

To gain a five-figure salary + car and enjoy outstanding career opportunities, candidates need a track record in project management and plenty of experience in submitting proposals for applications development.

Ref. CW. 35/2

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Commencing salary including allowance, within the range £4446 to £5232 per annum, plus current self-financing productivity payment.

Applications are invited for the position of Senior Computer Operator, experience of at least 2 years with IBM 360/370 hardware, running under OS/VS operating systems is desirable.

Our present installation comprises a 4.0 meg 3032 and a 2.0 meg 3031 IBM operating on a 3 x 8 hour shift/5 days a week basis. We undertake a wide variety of both batch and on-line applications and currently have about 550 VDU's installed throughout the Region.

Applicants should be prepared to work the shift system for which a 1/2% shift allowance will be paid.

For further information please Alan Hood on 01-486 9467 (daytime) or 01-651 3248 (evenings) or write (specifying full details) to the Personnel Manager, S/G/2 House, Falmouth Street, Croydon.

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## Anglian Water Authority PROGRAM ANALYST

Post No. R3R30. Grade 4 £4,179-£4,476 Inc. supplement (increase pending)

Applications are invited from suitably qualified and experienced persons for the above post based at Boston with the Resource Planning section of the Divisional Engineers Department. Applicants are expected to have a good degree in computer sciences and post-graduate qualifications in computer technology or equivalent with relevant experience, together with several years' general experience in applied computer technology.

Duties will include the development and preparation of programs, systems and computer compatible data in connection with surface water and groundwater studies and models, engineering resource, and flood studies and models, engineering design studies and other studies and models concerned with chemical data, quality control and abstraction control. The Division at present operates two on-line computer terminals and a small in-house computer with a number of peripheral units. The successful applicant will have responsibility for the overall effective and efficient use of computer facilities and, in particular, will act as the Division's Liaison Officer in connection with the Authority's Honeywell system based at Huntingdon.

The collection of Hydrometric, scientific, engineering, chemical, operational control and abstraction data forms a major part of the Division's workload, both routine, and in a development sense. It is essential that such data is made available and developed for effective and efficient use for management, engineers, scientists and administrators. The post offers an interesting opportunity to widen and broaden experience in applied computer techniques and to gain specialist knowledge in connection with water management.

N.J.C. for Water Service Staffs conditions of service apply and relocation expenses are payable in appropriate cases. At present the post carries a casual user's car allowance and a review of salaries is under negotiation.

Application forms, which are returnable by Wednesday, 18th September, 1979, are available from the Divisional Manager.

**George Ogden  
Divisional Manager  
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The successful candidate will ideally have Computer Programming/Systems Analyst experience preferably, but not necessarily, in Wholesale and/or Retail chain operations.

Initially the work will involve visiting and working in various locations throughout the U.K. The successful candidate will be expected to reside near Warminster, Wiltshire, and re-location expenses will be paid. A Contributory Pension Scheme is in operation.

Applicants are asked to write or telephone for an application form to

**Bernard Miller, F.C.A., Secretary  
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We need a Senior System Test Engineer and a less experienced Test Engineer - both with the flair, imagination and skill to build, commission and operate "Test Bed" models, at New Southgate and other sites, if required.

Part of the responsibility will be for purchasing necessary component and tools and software services. The Senior Engineer will control a small team of hardware and software engineers. A number of exchange models will be involved.

All candidates, male or female, must have at least an HNC/HND, in Electronic Engineering, and at least 3 years' experience in Test Engineering on electronic or computer based systems. Candidates for the senior post should also have some staff supervisory background.

Salaries will be negotiated. There are other useful benefits. Location is on the North London/Herts border.

Please telephone or write for an application form, quoting ref. REB6, to Mrs. G. Layelle, Recruitment Department, Standard Telephones and Cables Limited, Oakleigh Road South, New Southgate, London N11 1HB. Tel: 01-368 1234 Ext. 2263.

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of communications worldwide**

## THE SALES AND MARKETING BIT

**A formal 'job spec'  
is essential  
for every salesman**

A READER wrote in the other day describing a situation in which salesmen all too often find themselves immersed.

My correspondent works for an equipment manufacturer and is a member of a selling team. He is a conscientious and hardworking salesman and whenever any of his clients telephone the office with a problem, he does whatever is necessary to make the caller happy. Unfortunately, when clients find it necessary to seek a solution to non-sales problems (if there is such a thing) then the level of enthusiasm from other departments is substantially lacking.

Such has been the reluctance of the various supporting departments to provide real customer service that this particular salesman's clients will no longer deal directly with the appropriate service but instead telephone him and demand that he sort out the problem (like, "You do want to keep the business, don't you?").

The result is obviously a severe loss of selling time and consequently a loss of commission earnings and a target performance which is less than it might be.

Do in this kind of situation? As far as I can see it is all a function of what one is employed to do. While a salesman, above all people, needs to be very flexible in his attitudes and actions, he needs a point of reference so that when all else fails, he can make some kind of demarcation between his responsibilities and those of other people.

A salesman is employed to sell, but in his role of being the company to the client and the client to the company, he can become everybody's "whipping boy" when things go wrong. That is why it is essential for every salesman to have a formal job specification which precisely states his responsibilities, and if necessary his non-responsibilities.

Particularly in these days of the Employment Protection Act, any salesman operating without a job specification is a fool to himself.

Assuming the salesman is armed with a formal statement of his role within the company, it should then simply be a matter of discussing the problem with his sales manager. After all, the loss of selling time may also have a direct effect on his performance too, and consequently on that of the company as a whole. Ultimately, the managing director will want to know where such problems emanate and what has to be done to sort them out.

On the other hand, if the company shows no interest in providing effective client support, then the salesman's best action is to find a company that does.

Having said all that, my

spend a lot of time around the office sorting out non-sales problems is that many of them consciously or subconsciously prefer such activity to getting into the street and kicking in a few doors.

It is easy for a salesman to get himself deeply involved in a situation demanding considerable effort and time utilisation when it would be better for the company and himself to back off. Handling a problem which is not directly a selling matter is often a very slippery slope and once you are involved, it is difficult to escape until you get to the bottom.

Sometimes the salesman's refusal to become involved can be to the client's detriment. If that happens too often, then there is something drastically wrong with the salesman's company and the remedy is in his own hands.

One old fact has to be observed: It's the salesman's employer who pays him, not the client, and loyalties must take that into account. So what I'm saying is that salesmen are employed to sell and that means the maximisation of the time which can be made available for this activity to take place. If the amount of time is impeded by an unreasonable amount of activity which is ostensibly the province of other people's departments, then it is up to the salesman, no one else, to decide whether the fault lies within his conscious or subconscious self or whether it is a failing within his company - then act accordingly.

The existence of formal terms of reference make subsequent debate rather more rational than it might be otherwise.

**TRADER**

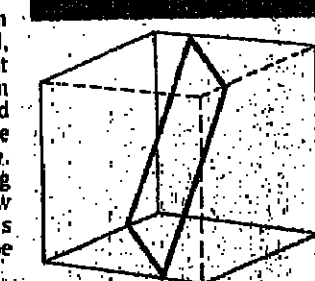
## PRODUCT NOTE

### Converter

BURR-BROWN has introduced a low-cost digital to analogue converter. The DA 71 is available for three types of digital input at TTL levels.

Burr-Brown International (CW), 17 Exchange Road, Watford, Tel: 0923 33637.

### Puzzle Answer



THE 'largest square' plate that will fit inside the box has a side measurement of 2x2 and it must be placed with each corner one-quarter of a centimetre away from an interface.







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## NEWS IN BRIEF

## STSC reports \$927,000 loss

A LOSS in Europe of \$927,000 on a turnover of only \$321,000 has been reported by APL specialist Scientific Time Sharing Corp. In the results for its 1979 fiscal year which ended on May 31.

The president of STSC in the US, Daniel Dyer, said that expansion in Europe had been more expensive than expected.

## Good start

THE ICL 7700 word processor, which can be used as a stand-alone system but is primarily designed for use with ICL mainframes, has got off to a satisfactory start, with UK orders for about 40 worth over £600,000.

## Repeat course

LOUGHBOROUGH University's five-day course on computer ergonomics for managers and designers is being repeated from September 24 to 28. Topics to be covered include the design of terminals, computer environment, user software interfaces, and documentation. Attendance fee including accommodation is £240. Information from (0508) 63171, ext. 382.

## Fairchild visit

SECRETARY of State for Trade John Nott is to visit the Fairchild semiconductor facility in Mountain View, California, next month during a tour of Australia, New Zealand, Fiji and the US West Coast. He will also address the British American Chamber of Commerce in Los Angeles.

## 220% growth in personal systems in 1980

A UK MARKET for personal computer systems of some £272 million is being predicted for 1983 by the Commercial Intelligence Unit of ITC Consumer Electronics, the manufacturer of the ITC 2020 microcomputer system.

This figure, which does not include potential sales of single board kit system, corresponds to the company's estimate of unit sales in that year, 250,000 systems, multiplied by their estimate of the average sales price, £1,090, for such equipment.

The research effort is part of the company's growing commitment to the 2020 system, which it is assembling under licence in this country from Apple in the US.

The predictions include some interesting estimates of the way ITC feels the market will develop. It sees little scope for a hobby market, and expects that the majority of sales will be to business establishments.

This year, it forecasts sales of 25,000 systems in the UK, with the big growth in the market coming in 1980. Then, it predicts a jump in unit sales of about 220%, to 80,000

systems. Growth in subsequent years will fall off slightly, with 1981 growing 8.7% over 1980, 1982 growing by 3.3% and 1983 showing a 2.5% growth.

ITC is also suggesting that bubble memory could have a significant impact on microcomputer systems by the mid 1980s. It expects to see volume production of these devices by 1982, at a price that would produce memory systems price-competitive with current audio cassette equipment.

## IBM ousts ICL in supermarket chain

AFTER wrestling Tesco from ICL last year, IBM is replacing ICL at another supermarket chain, Mac Markets, as the result of a merger last week between Mac Markets and International Stores, an IBM user.

International's parent, BAT Industries, owns 75% of the new merged supermarket group, and the plan is to centralise all computer operations over the next three years on to an IBM mainframe at a new installation at Bracknell.

NCR as well as ICL will lose out because the work from a Criterion 8450 at the Rainham, Essex, headquarters of the Wallis supermarket chain, which was taken over by International two years ago, is also to be transferred to Bracknell.

At the moment the Mac Markets computer centre at Farnborough, Hants, operates an ICL 1903T which is being upgraded

Swanley, Kent and the workload from the 148 will be the first to be transferred to Bracknell. The Swanley centre will be closed down completely by the end of next year.

The IBM machine at Bracknell will initially be a 3031 which is expected to be installed there by the end of this year. A bigger IBM mainframe will almost certainly be needed by the time the centralisation process is complete.

ICL was also the victim of rationalisation of DP activities within the Grand Metropolitan Hotels group, whose DP division, Grandmet Information Processing, Grip, decided to

standardise on IBM equipment (CW, February 17, 1977). Grip was formed after Grandmet took over brewers Watney Mann.

Mergers and takeovers usually mean lost business for at least one computer company, but one announced last week, between the Newcastle Permanent and the St Andrews building societies leaves everybody happy. The Newcastle Permanent has a Burroughs B1830, recently upgraded from a B1714, while the St Andrews has a Burroughs L series visible record computer. At present there are no plans to merge the two computer operations.

## Counter revolution

From front page. Counter terminals in a big way.

Computer Weekly that there had to be an end to the vast quantities of paper which had to be transferred in the clearing operation (CW, May 27, 1978), and shortly afterwards started to experiment with Burroughs TD 700 terminals (CW, October 21, 1976).

The bank now has 200 Burroughs terminals in operation at cashier positions, but describes the systems as still experimental, adding only that magnetic stripe cards are not involved.

National Westminster has two experiments under way. At one of its Leicester branches, there is an IBM card reader terminal similar to the one used by Lloyds. However, in this experiment, the customer hands his card over to the cashier who

feeds it into the terminal, which means that a second magnetic stripe card is issued to the customer, since the card used with NatWest's cash dispensers carries a secret number known only to the customer.

In the other experiment a Burroughs terminal linked to an automatic note dispenser is being tried out at cashier positions in the bank's Enfield branch.

Barclays plans to begin its first pilot experiment in six to eight months at a few branches, and will equip teller positions with a Fortronic terminal consisting of a numeric key-pad and small receipt printer. Barclays gave no further details of the terminal, but it is likely to be similar to the one Fortronic has been supplying to Clydesdale Bank in Scotland.

## SEL founder kidnapped in Sardinia

CO-FOUNDER of SE Laboratories Rolf Schild and his wife and daughter were kidnapped last week while on holiday in Sardinia. Some days later their burnt-out car was found 80 miles away from their villa on the island's north coast, but no Computer Weekly went to press there was no firm news as to the family's fate.

One telephone call was received from a group calling itself the Red Guerrillas and claiming to be holding the Schilds and demanding the release of Italian political prisoners.

The police were following up this call but thought that it was most likely a hoax. They were still awaiting a ransom demand.

The Italian Premier, a native of Sardinia who is on holiday on the island, is taking a close interest in the case and with the Interior Minister, Signor Rognoni, is reported to have taken personal charge of the police hunt.

Schild and his colleagues were co-founders of their own electronics company, SE Laboratories, in 1965 and about 10 years later this highly successful venture was acquired by EMI for over £2 million.

The two partners stayed on with EMI in various directorial capacities until 1973 when they left to become joint chief executives of the Huntleigh Group. This has been expanded under their control and now includes companies in the electronics, instrumentation and aviation fields. It also includes Micro Image Technology which specialises in ultra-pure chemicals used in the manufacture of semiconductors.

## Gamma moves into mainframe systems

WITH the acquisition of a Manchester-based software house specialising in financial systems, Gamma Associates computer group has taken its first step to servicing the mainframe market.

At the same time, the move is understood to be the first of several ventures planned by Gamma in the north west, a region which it sees as a second significant market.

Gamma Computer Services, in which Gamma has taken a majority stake, was formed two years ago. Its main efforts since then have gone into the development of two highly regarded financial software packages—fixed assets register and a financial planning system.

These will now be marketed by the renamed Gamma Ltd with the full support of Gamma.

The fixed asset system, FARS, is seen by both companies as catering comprehensively to assets management. Designed for interactive operation, it is written in Fortran IV and supported on equipment including IBM, ICL and ICI mainframes, the PDP 11, 11/2000, and Prime.

## \$10m Gray

A CRAY 1 supercomputer worth \$10 million is to be installed at the Los Alamos Scientific Laboratory, New Mexico. But an order for a Cray 1B worth \$8.5 million from Sandia Laboratory, of Livermore, California, has been jeopardised following complaints from unsuccessful bidders that the terms of the request for tenders were impractical. The laboratory is to go out to tender a second time.

## COMPUTER MARKETING HAVE IT...

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Newbury Labs range of British VDU's	£32.00	£495
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TALLY T-1612 160 cps Bi-Directional keyboard printer	£111.00	£1725
TALLY T-1602 160 cps Bi-Directional printer with LA160 interface	£100.00	£1650
TALLY T-2000 Q Quietized 200 LPM Line printer	£196.00	£3000
LA34 Decwriter IV	£50.00	£825
LA120 Decwriter	£102.00	£1675
1650 XSR Correspondence type keyboard printer terminal	£140.00	£2302
AJ211 Acoustic coupler	£10.00	£193
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Model 281 Multicolour Graphics plotter	£156.00	£2500
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